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1.0 INTRODUCTION AND GENERAL DESCRIPTION OF THE PLANT

This chapter of the U.S. EPR Final Safety Analysis Report (FSAR) is incorporated by reference with supplements as identified in the following sections.

1.1 INTRODUCTION

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

This Final Safety Analysis Report is submitted to the Nuclear Regulatory Commission as part of an application for a Class 103 combined license (COL) to construct and operate a nuclear power facility under the provisions of 10 CFR 52, Subpart C. This nuclear power facility is designated {Callaway Plant Unit 2.} This FSAR incorporates the FSAR prepared for the design certification application for the AREVA evolutionary pressurized water reactor, (herein referred to as the U.S. EPR) including supplements 1 and 2. AREVA NP, the entity sponsoring the design certification application for the U.S. EPR, submitted the U.S. EPR design certification application, including the U.S. EPR FSAR, to the NRC on December 11, 2007 (AREVA, 2007). U.S. EPR FSAR Supplement 1 (AREVA, 2008a) was submitted to the NRC on February 7, 2008. U.S. EPR FSAR Supplement 2 (AREVA, 2008b) was submitted to the NRC on February 20, 2008.

Upon approval and issuance of the design certification for the U.S. EPR, the approved version of the FSAR for the U.S. EPR and the associated Appendix to 10 CFR 52 documenting the design certification for the U.S. EPR are incorporated by reference into this COL application. Within each section, or subsection, only supplemental information or departures from the certified design are presented. If the U.S. EPR provides sufficient information, this FSAR will state "This section of the U.S. EPR FSAR is incorporated by reference" at the section (i.e. X.Y) level and "No departures or supplements" at the highest subsection level where such a statement can be made. Likewise, if a section contains additional information, a statement is provided at the section level to identify if departures or supplements are provided. Section and subsection numbering is only provided to the extent necessary to provide sufficient context to correlate the information provided in this FSAR with the information provided in the U.S. EPR FSAR.

Supplemental information is provided in three forms. Additional information, such as this text, is provided in the appropriate section. The second form is COL Item responses. COL Items are statements in the U.S. EPR FSAR that indicate that the COL applicant must provide additional information. Each applicable COL Item is restated in the equivalent section/subsection in this FSAR and information to address the COL Item is provided. The final type of supplemental information provided in this FSAR is to address conceptual design information provided in the U.S. EPR FSAR. Conceptual design information is presented in the U.S. EPR FSAR enclosed in double brackets "[[ ]]". As stated in the U.S. EPR FSAR, the conceptual design information is outside the scope of the U.S. EPR standard design, and is not submitted for certification as part of that document. Like COL Items, the conceptual design information is restated in this FSAR followed by the site specific information.

Departures from the U.S. EPR FSAR are identified in the applicable sections of the COL Application.

U.S. EPR nuclear power plants that are licensed, constructed, and operated in cooperation with UniStar Nuclear Operating Services LLC (UniStar Nuclear Operating Services) are standardized to the extent practical. This allows for a standardized FSAR. Information that is unique to {Callaway Plant Unit 2} is enclosed in braces "{ }". Information not enclosed in braces is generic for all UniStar Nuclear Operating Services facilities. {The terms "braces" and "brackets" are used

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interchangeably in this document.} Minor changes are made within the generic text that are not identified as site specific. These include figure and table numbers, which are organized sequentially within sections, and minor grammatical changes necessary to support introduction of site specific text. {Tables and figures containing site specific information use the convention of brackets/braces around the table or figure title, not the entire table or figure contents. This convention indicates the entire table or figure is site specific.}

The U.S. EPR FSAR includes the following COL Item in Section 1.1:

> A combined license (COL) applicant that references the U.S. EPR design certification and proposes a multi-unit license application will provide the changes and additional information needed to license a multi-unit plant.

This COL Item is addressed as follows:

{This COL application is for a single unit U.S. EPR. As such, no changes or additional information are needed to address this COL Item.}

1.1.1 PLANT LOCATION

The U.S. EPR FSAR includes the following COL Item in Section 1.1.1:

> A COL applicant that references the U.S. EPR design certification will identify the specific plant site location.

This COL Item is addressed as follows:

{Callaway Plant Unit 2 is co-located with Callaway Plant Unit 1 at the Callaway Plant site. The Callaway Plant site is 10 miles east-southeast of the city of Fulton in Callaway County, Missouri, and 80 miles west of the St. Louis metropolitan area. The nearest population center is Jefferson City, Missouri, located 25 miles west-southwest of the site. The plant site, consisting of approximately 2,800 acres of rural land, is located on a high plateau approximately 325 feet above the Missouri River, which is about five miles to the south (see Figure 1.1-1, Figure 1.1-2, and Figure 1.1-3).

The interfaces between Callaway Plant Unit 1 and Callaway Plant Unit 2 are limited to the following:

- Offsite transmission system - TheCallaway Plant Unit 2 substation is electrically integrated with the existing Callaway Plant Unit 1, 345 kV, substation. While the offsite transmission system is shared between Callaway Plant Unit 2 and Callaway Plant Unit 1, Callaway Plant Unit 2 has onsite AC and DC systems that are dedicated to its use. The offsite AC power sources are described in more detail in Sections 8.1 and 8.2, and the onsite power sources are described in Section 8.3.

- The cooling tower water makeup system, which draws water from a series of collector wells along the Missouri River, and the plant discharge line, which discharges cooling tower blowdown water, is shared between Callaway Plant Units 1 and 2. The cooling tower water makeup system (collector well system) is described in more detail in Section 9.2.9.

- The potable water and sanitary waste water systems - The potable water system provides chlorinated water for the domestic water needs of the power block and other

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permanent plant buildings. The sanitary waste water system provides for collection, treatment and discharge of sanitary waste water generated during site operations. These two systems are described in more detail in Section 9.2.4.

- The demineralized water makeup system provides demineralized water to support plant operations. The demineralized water supply is from Callaway Plant Unit 1. The Callaway Plant Unit 2 distribution system is addressed in Section 9.2.3.

- Meteorological tower - The meteorological tower provides meteorological data to Callaway Units 1 and 2 to support normal and emergency response operations. It is described in more detail in Section 2.3.3.

- Emergency Operations Facility (EOF) and Technical Support Center (TSC) - The EOF and TSC are described in more detail in Part 5 of the COL application.

The structures, systems, and components are designed such that a design basis accident in one unit, would not impact safe operation of the other unit.}

In accordance with 10 CFR 52.79(a)(31) (CFR, 2008), the following provides an assessment of the potential hazards to the structures, systems, and components (SSCs) important to safety of operating units resulting from construction activities at a multi-unit site and identifies that managerial and administrative controls are to be used to provide assurance that the limiting conditions for operation (LCOs) at the operating units, are not exceeded as a result of new plant construction activities.

{The managerial and administrative controls include coordination, with Callaway Plant Unit 1, of construction activities which have the potential for causing Callaway Plant Unit 1 to exceed LCOs or have an adverse impact on the availability of safety and risk significant SSCs. Callaway Plant Unit 1 procedures and processes are currently in place to control activities that could affect compliance with an LCO or availability of safety and risk significant SSCs, e.g., equipment clearance and tagout procedures, access controls, and switchyard controls.

The potential hazards associated with Callaway Plant Unit 2 construction activities include, but are not limited to: general construction activities such as site exploration, grading, clearing, and installation of drainage and erosion-control measures; boring, drilling, dredging, pile driving and excavating; transportation, storage and warehousing of equipment; construction, erection, and fabrication of new facilities; and connection, integration, and testing. Specific potential impacts to Callaway Plant Unit 1 SSCs include the following:

- Relocation and construction of transmission lines/towers.

- Meteorological data transmission modifications (electrical and instrumentation tie-ins and connections to provide input to Callaway Plant Unit 2 facilities).

- Modification to the existing Emergency Response Facilities to accommodate Callaway Plant Unit 2 Emergency Planning activities.

The majority of the Callaway Plant Unit 1 SSCs important to safety are contained and protected within safety-related structures. Managerial controls will protect these internal SSCs from postulated construction hazards by maintaining the integrity and design basis of the safety-related structures and foundations. Heavy load drop controls, crane boom failure standoff requirements, ground vibration controls and construction generated missiles controls

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are examples of managerial controls that shall be established to provide this reasonable assurance.

Other managerial controls shall be established to ensure that hazardous materials and gasses are controlled, cooling water supplies are protected, instrumentation is protected from vibrations, and the SSCs are protected from site excavation issues. These managerial controls prevent or mitigate external construction impacts that could affect these SSCs. These controls also prevent or mitigate unnecessary challenges to Callaway Plant Unit 1 safety systems that could be caused by potential Callaway Plant Unit 2 construction activity hazards, such as disruption of offsite transmission lines or impact to cooling water supplies. Onsite construction activities with potential safety significance to the operating units shall also be addressed in accordance with established Callaway Plant Unit 1 procedures and processes, as described above.

Construction impacts on security controls are addressed in the Callaway Plant Unit 2 Security Plan. The Callaway Plant Unit 2 Security Plan is provided in Part 8 of the COL application.}

Additional site details are provided in Chapter 2.

1.1.2 CONTAINMENT TYPE

No departures or supplements.

1.1.3 REACTOR TYPE

No departures or supplements.

1.1.4 POWER OUTPUT

No departures or supplements.

1.1.5 SCHEDULE

The U.S. EPR FSAR includes the following COL Item in Section 1.1.5:

> A COL applicant that references the U.S. EPR design certification will provide the estimated schedules for completion of construction and commercial operation.

This COL Item is addressed as follows:

{The schedule milestones for Callaway Plant Unit 2 are:

Activity	Milestone Date	Estimated Duration
Design Certification Submitted (AREVA NP)	11 December 2007	0 months
Reference COLA Submitted (Unistar)	14 March 2008	0 months
Callaway COLA Submitted	04 August 2008	0 months
NRC Review and COL Approval		39 months
NRC Issue COL	October 2011	0 months
Construction Start	April 2012	6 months
Construction and Unit Startup		68 months
Commercial Operation Date (COD)	December 2017	0 months}

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1.1.6 FORMAT AND CONTENT

1.1.6.1 Regulatory Guide 1.206

This FSAR follows the U.S. EPR FSAR organization and numbering. The U.S. EPR FSAR was written in accordance with the format and content of Regulatory Guide 1.206, (NRC, 2007). This FSAR provides departures and supplemental information from the standard U.S. EPR design that is unique to the {Callaway Plant Unit 2} project. If the information provided in the U.S. EPR FSAR sufficiently addresses the Regulatory Guide 1.206 content for {Callaway Plant Unit 2}, this FSAR will state "No departures or supplements" at the highest section level where such a statement can be made.

In addition, this FSAR may add a final section or subsection (when necessary) for references made within this document. References will be provided if they are used in this FSAR even if they were identified within the U.S. EPR FSAR.

1.1.6.2 Standard Review Plan

No departures or supplements.

1.1.6.3 Text, Tables and Figures

Tables and figures are identified by the section or subsection in which they appear and are numbered sequentially. For example, Table 1.1-1 and Figure 1.1-1 would be the first table and figure appearing in Section 1.1. Figures consist of diagrams, plots, pictures, graphs or other illustrations. Tables and figures are located at the end of the applicable section (X.Y) immediately following the text.

1.1.6.4 Numbering of Pages

Pages are numbered sequentially within each chapter. Chapter 2 is an exception due to its size. In Chapter 2, the pages are sequential within each subsection.

1.1.6.5 Proprietary Information

This document contains no proprietary information.

1.1.6.6 Acronyms

Table 1.1-1 provides a list of acronyms that are used in this document that are not described in U.S. EPR FSAR Table 1.1-1.

1.1.6.7 COL Information Items

The COL items in the U.S. EPR FSAR are discussed in Section 1.8.

1.1.6.8 Tense

This section is added as a supplement to the U.S. EPR FSAR.

This FSAR is a licensing basis document that will control plant design and operations after the COL is issued and is generally written in the present tense. Plant design and configuration are described in the present tense although the plant is not yet built. Similarly, programs, procedures, and organizational matters are generally described in the present tense although such descriptions may not yet be implemented. Accordingly, the use of the present tense in this FSAR should be understood as describing the plant, programs and procedures, and

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organization as they will exist when in place, and not as a representation that they are already in place.

1.1.7 REFERENCES

{This section is added as a supplement to the U.S. EPR FSAR.

AREVA, 2007. S. Sloan letter to U.S. Nuclear Regulatory Commission Document Control Desk, Application for Standard Design Certification of the U.S. EPR (Project No. 733), dated December 11, 2007.

AREVA, 2008a. R. Gardner letter to U.S. Nuclear Regulatory Commission Document Control Desk, U.S. EPR Final Safety Analysis Report, Supplement 1, dated February 7, 2008.

AREVA, 2008b. R. Gardner letter to U.S. Nuclear Regulatory Commission Document Control Desk, U.S. EPR Final Safety Analysis Report, Supplement 2, dated February 20, 2008.

CFR, 2008. Title 10, Code of Federal Regulations, Part 52.79, Contents of Applications; Technical Information in Final Safety Analysis Report, U.S. Nuclear Regulatory Commission, 2008.

NRC, 2007. Combined License Applications for Nuclear Power Plants (LWR Edition), Regulatory Guide 1.206, Revision 0, U.S. Nuclear Regulatory Commission, March 2007.}

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Table 1.1-1—{Acronyms Used in this Document}
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Acronym	Description
χ/Q	Atmospheric Dispersion Value
A	Aesthetics
AAPG	American Association of Petroleum Geologists
A/E	Architect – Engineer
AB	Access Building
AC	Air Conditioners
ACCA	Air Conditioning Contractors of America
ACI	American Concrete Institute
ACWS	Auxiliary Cooling Water System
ADA	Americans with Disabilities Act
ADT	Averaged Daily Traffic
AE	Aquatic Ecosystems
AEA	Atomic Energy Act
AEC	Acceptable Effluent Concentration
AEEI	Autonomous Energy Efficiency Improvement
AFDD	Accumulated Freezing Degree-Days
AFFF	Aqueous Film-Forming Foam
AOV	Air-Operated Valve
AFDD	Accumulated Freezing Degree-Days
AASHTO	American Association of State Highway and Transportation Officials
ALARA	As Low As Reasonably Achievable
ALIs	Annual Limits on Intake
ALOHA	Areal Locations of Hazardous Atmospheres
ANS	American Nuclear Society
ANSI	American National Standards Institute
ANSS	Advanced National Seismic Network
APE	Areas of Potential Effect
AQ	Air Quality
AQCR	Air Quality Control Region
AQL	Aquatic Life
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASM	Ancillary Services Market
ATWS	Anticipated Transients Without Scram
AWWA	American Water Works Association
BA/BL	Blytheville Arch/Bootheel Lineament
BA/BFZ	Blytheville Arch/Blytheville Fault
BCSD	Boone County Regional Sewer District
BE	Best Estimate
BEA	U. S. Bureau of Economic Analysis
BF	Butterfly Valve
BGS	Below Ground Surface
BIA	Bureau of Indian Affairs
BMA	Brunswick Magnetic Anomaly
B&Mc	Burns & McDonnell
BMPs	Best Management Practices
BOC	Building Operator Certification
BOP	Balance of Plant
BPU	Kansas City Board of Utilities

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Table 1.1-1—{Acronyms Used in this Document}
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BSNP	Missouri River Bank Stabilization and Navigation Project
BTA	Best Technology Available
B&V	Black & Veach
BWR	Boiling Water Reactors
C/NM	Consumable/Non-Metallic
CAA	Clean Air Act
CAM	Continuous Air Monitor
CAPS	Circular Area Profiles
CARES	Center for Agricultural, Resource, and Environmental Systems
CCs	Combined Cycle
CCDP	Conditional Core Damage Probability
CCF	Common Cause Failure
CCWS	Component Cooling Water System
CD	Certified Design
CDC	Center for Disease Control
CDE	Committed Dose Equivalent
CDF	Core Damage Frequency
CE	Constellation Energy
CEQ	Council on Environmental Quality
CERC	Columbia Environmental Research Center
CEUS	Central and Eastern United States
CFL	Compact Fluorescent Light
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CGP	Land Disturbance Construction General Permit
CH	High Plasticity
CHIEF	Clearinghouse for Inventories and Emissions Factors
CJC	Cotter-Jefferson City
CK	Check Valve
CL	Low Plasticity
CLCWS	Closed Cooling Water System
CN	Curve Number
CNO	Chief Nuclear Officer
CO	Carbon Monoxide
COD	Commercial Operation Date
COL	Combined Operating License
COLA	Combined License Application
CORMIX	Cornell Mixing Zone Expert System
CPE	Catch-per-unit-effort
CPT	Cone Penetrometer Test
CR	Control Room or County Road
CRACS	Control Room Air Conditioning System
CRDMs	Control Rod Drive Mechanism
CRE	Control Room Envelope
CRR	Cyclic Resistance Ratio
CRREL	Cold Regions Research and Engineering Laboratory
CRSG	Contingency Reserve Sharing Group
CS	Conventional Seismic
CSDRS	Certified Seismic Design Response Spectra
CSR	Cyclic Stress Ratio

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Table 1.1-1—{Acronyms Used in this Document}
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CTI	Cooling Tower Institute
CWA	Clean Water Act
CWIS	Cooling Water Intake Structures
CWS	Circulating Water System
D/Q	Deposition Factor
DAC	Derived Air Concentration
DAW	Dry Active Waste
DBA	Design Basis Accident
DBT	Design Basis Tornado
DC	Direct Current
DCD	Design Certification Document
DE	Dose Equivalent or De-Aggregated Earthquake
DED	Missouri Department of Economic Development
DEER	Database for Energy Efficiency Resources
DEM	Digital Elevation Map
DGLS	MDNR Division of Geology an d Land Survey
DI	Diaphragm Valve
DO	Dissolved Oxygen
DOE	Department of Energy
DOI	U. S. Department of Interior
DOT	Department of Transportation
DRS	Design Response Spectrum
DSM	Demand-Sided Management
DTD	Drum Transfer Device
DTED	Digital Terrain Elevation Data
DWD	Division of Workforce Development
EAB	Exclusion Area Boundary
EAT	Emergency Auxiliary Transformer
EC	Erosion/Corrosion
ECL	Effluent Concentration Limits
ED	Energy Delivery
EDGs	Emergency Diesel Generators
EFH	Essential Fish Habitat
EFW	Emergency Feedwater
EH	Extra Hazard
EIA	Energy Information Administration
EIP	Emergency Implementing Procedures
EIS	Environmental Impact Statement
EMC	Electromagnetic Compatibility
EMTs	Emergency Medical Technicians
EMWG	Economic Modeling Working Group
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedures
EPIX	Equipment Performance and Information Exchange
EPA	U. S. Environmental Protection Agency
EPGB	Emergency Power Generating Buildings
EPR	Evolutionary Power Reactor
EPRI	Electric Power Research Institute
EPSS	Emergency Power Supply System
EPT	Ephemeroptera, Plecoptera, and Trichoptera

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Table 1.1-1—{Acronyms Used in this Document}
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EPZ	Emergency Planning Zone
EQ	Environmental Qualification
ER	Environmental Report or Electrical Resistivity
ERO	Electric Reliability Organization
ES	Engineered Safeguards or Erosion/Sediment
ESA	Endangered Species Act
ESL	English as a Second Language
ESP	Early Site Permit
ESRP	Environmental Standard Review Plan
ESWB	Essential Service Water Building
ESWEMS	Essential Service Water Emergency Makeup System
ESW	Essential Service Water
ESWS	Essential Service Water System
ETR	Energy Transfer Ratio
EUPS	Class 1E Uninterruptible Power Supply
FAA	Federal Aviation Administration
FAC	Flow Accelerated Corrosion
FBC	Fluidized Bed Combustor
FEIS	Final Environmental Impact Statement
FC	Fines Content
FDD	Freezing Degree-Day
FDT	Fire Dynamics Tools
FEM	Finite Element Model
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FF	Free-Free Resonant Column Tests
FFD	Fitness for Duty
FGD	Flue Gas Desulfurization
FHA	Fire Hazards Analysis
FIRS	Foundation Input Response Spectra
FMEA	Failure Modes and Effects Analysis
FOS	Factor of Safety
FPA	Fire Protection Analysis
FPE	Fire Protection Engineer
FPP	Fire Protection Program
FRP	Fiberglass-Reinforced Plastic
FS	Factors of Safety
FSAR	Final Safety Analysis Report
FT	Formation Thickness
FTE	Full-Time Equivalent
FTR	Financial Transmission Rights
FV	Fussell-Vessely
FWDS	Fire Water Distribution System
GB	Globe Valve
GDP	Gross Domestic Product
GED	General Education Diploma
GEIS	Generic Environmental Impact Statement
GHG	Greenhouse Gas
GIF	Generation IV International Forum
GMRS	Ground Motion Response Spectrum

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Table 1.1-1—{Acronyms Used in this Document}
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GPM	Gallons per Minute
GSA	Geological Society of America
GT	Gate Valve
GTC	Gasification Technologies Council
GTG	Gas Turbine Generator
GW	Ground Water
HC	Hydrocarbons
HCLPF	High Confidence, Low Probability of Failure
HF	High Frequency
HFE	Human Factors Engineering
HICs	High Integrity Containers
HMR	Hydrometeorological Report
HMTA	Hazardous Materials Transportation Act
HO	Hydraulic Operated
HPM	Human Performance Monitoring
HPS	Health Physics Society
HRA	Human Reliability Analyses
HRCQ	Highway Route Controlled Quantity
HRR	Heat Release Rates
HSI	Human System Interface
HSS	High Safety Significance
HUC	Hydrologic Unit Code
ICEA	Insulated Cable Engineers Association
I&C	Instrumentation and Controls
ICI	Invertebrate Community Index
ICRP	International Commission on Radiological Protection
ID	Identification
IDF	Inflow Design Flood
IDLH	Immediately Dangerous to Life and Health
IGCC	Integrated Coal Gasification Combined Cycle
INEEL	Idaho National Engineering and Environmental Laboratory
IPPs	Independent Power Producers
IRC	Independent Review Committee
IRP	Integrated Resource Plan
ISFSI	Independent Spent Fuel Storage Installation
ISGS	Illinois State Geological Survey
ISI	In-Service Inspection
ISRS	Instructure Response Spectra
Midwest ISO	Midwest Independent Transmission System Operator
IST	In-Service Testing
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
JFD	Joint Frequency Distribution
JPM	Job Performance Measures
KKS	Kraftworks Kennzeichen System
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-Hour
LAUS	Local Area Unemployment Statistics
LB	Lower Bound
LBB	Leak Before Break

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LCI	Land Cover Institute
LCOs	Limiting Conditions for Operation
LEED	Leadership in Energy and Environmental Design
LERF	Large Early Release Frequency
LES	Louisiana Energy Services
LF	Low Frequency
LFG	Land Fill Gas
LFL	Lower Flammability Limit
LFU	Load Forecast Uncertainty
LiDAR	Light Detection and Ranging
LLC	Limited Liability Company
LLD	Lower Limits of Detection
LLNL	Lawrence Livermore National Laboratory
LLW	Low Level Waste
LNG	Liquified Natural Gas
LOCA	Loss of Coolant Accident
LOLE	Loss of Load Expectation
LOLP	Loss of Load Probability
LOOP	Loss of Off-Site Power
LPGS	Liquid Pathway Generic Study
LPM	Liters per Minute
LPSD	Low Power Shutdown
LPZ	Low Population Zone
LRA	Locked Rotor Accident
LRF	Large Release Frequency
LSE	Load Serving Entity
LSS	Low Safety Significance
LTM	Low Trajectory Missile
LULC	Land Use and Land Cover
LWR	Light Water Reactor
MA	Manual Actuated
MAAP	Modular Accident Analysis Program
MACOG	Missouri Association of Councils of Government
MAFS	Montana American Fisheries Society
MAIN	Mid-American Interconnected Network
MCDC	Missouri Census Data Center
MCDs	Minor Civil Division
MCR	Main Control Room
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MDSS	Missouri Department of Social Services
MDWCT	Mechanical Draft Wet Cooling Tower
MED	Master Equipment Database
MEDEVAC	Medical Evacuation
MEI	Maximally Exposed Individuals
MEOW	Maximum Envelopes of Water
MERIC	Missouri Economic Research and Information Center
MESA	Mining Enforcement and Safety Administration
MGD	Million Gallons of Water per Day
MISO	Midwest Independent System Operator

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Table 1.1-1—{Acronyms Used in this Document}
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MLD	Million Liters per Day
MMI	Modified Mercalli Intensity
MML	Missouri Municipal League
MOM	Maximum of the MEOWS
MOV	Motor Operated Valve
MPFF	Maintenance Preventable Functional Failure
MPT	Main Power Transformer
MR	Maintenance Rule
MRCP	Missouri Radiation Control Program
MRFF	Maintenance Rule Functional Failure
MRN-NEEM	Multi-Regional National-North American Electricity & Environment Model
MSA	Metropolitan Statistical Area
MSDIS	Missouri Spatial Data Information
MSL	Mean Sea Level
MSPI	Mitigating System Performance Index
MSS	Medium Safety Significance
MSU	Main Step-Up
MSW	Municipal Solid Wastes
MW	Megawatts
MWd/MTU	Megawatt Days per Metric Ton Uranium
WMH	Montgomery Watson Harza
N	Noise
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NAIP	National Agricultural Imagery Program
NAT	Normal Auxiliary Transformer
NEC	National Electrical Code
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NESC	National Electric Safety Code
NETL	National Energy Technology Laboratory
NFPA	National Fire Protection Association
NGDC	National Geophysical Data Center
NGVD 29	National Geodetic Vertical Datum of 1929
NHC	National Hurricane Center
NHPA	National Historic Preservation Act
NHS	Normal Heat Sink
NI	Nuclear Island
NIC	National Ice Center
NIOSH	National Institute for Occupational Safety and Health
NLCD	National Land Cover Data
NLSWE	Nonlinear Shallow Water Equations
NMFS	New Madrid Fault System
NMPS	National Marine Fisheries Service
NMRC	New Madrid Rift Complex
NMSZ	New Madrid Seismic Zone
NN	New Madrid North
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrogen Oxides

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Table 1.1-1—{Acronyms Used in this Document}
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NP	Non-Proprietary
NPDES	National Pollution Discharge Elimination System
NPDWA	National Primary Drinking Water Regulation
NPRDS	Nuclear Plant Reliability Data System
NPSS	Normal Power Supply System
NPV	Net Present Value
NRC	Nuclear Regulatory Commission
NRCS	U.S. National Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRS	No Risk Significance
NS	New Madrid South
NSDWA	National Secondary Drinking Water Regulation
NSR	New Source Review
NWS	National Weather Service
O&M	Operations and Management
OAQPS	Office of Air Quality Planning an d Standards
OATS	Older Adults Transportation Services
OBW	Operating Basis Wind
OCA	Owner Controlled Area
OCR	Over Consolidation Ratio
OCWS	Operational Chilled Water System
ODCM	Offsite Dose Calculation Manual
ODS	Ozone-Depleting Substance
OH	Ordinary Hazard
OHWM	Ordinary High Water Mark
OJT	On-the-Job Training
ORP	Oxygen-Reduction Potential
OSC	Operational Support Center
OSGSF	Old Steam Generator Storage Facility
OSHA	Occupational Safety and Health Administration
PA	Pilot Actuated
PASS	Person Alert Safety System
PCB	Polychlorinated Biphenyl
PCA	Primary Coolant Activity
PCP	Process Control Program
PDA	Pile Driving Analyzer
PDF	Probability Distribution Function
PEM	Palustrine Emergent Wetlands
PFO	Palustrine Forested Wetlands
PGA	Peak Ground Acceleration
PI	Plasticity Index
PL	Plug Valve
PM	Particulate Matter or Preventative Maintenance
PMF	Probable Maximum Flood
PMH	Probable Maximum Hurricane
PMP	Probable Maximum Precipitation
PMSS	Probable Maximum Storm Surge
PMT	Probable Maximum Tsunami
PMTs	Pressuremeter Tests

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Table 1.1-1—{Acronyms Used in this Document}
(Page 9 of 12)

PMWP	Probable Maximum Winter Precipitation
PP	Pocket Penetrometer
PPA	Power Purchase Agreement
PPE	Plant Parameter Envelope
PPM	Parts per Million
PPRP	Power Plant Research Program
PPT	Part per Thousand
PRA	Probabilistic Risk Assessment
PRB	Powder River Basin
PSAR	Preliminary Safety Analysis Report
PSC	Public Service Commission
PSD	Prevention of Significant Deterioration
PSHA	Probabilistic Seismic Hazard Analysis
PSP	Physical Security Plan
PSS	Palustrine Scrub Shrub Wetlands
PSSE	Power System State Estimation
PST	Pre-Service Testing
PSWS	Potable and Sanitary Water System
PTC	Production Tax Credit
PTLR	Pressure and Temperature Limits Report
PUB	Palustrine Unconsolidated Bottom
PV	Photovoltaic
PVC	Polyvinyl Chloride
PWR	Pressurized Water Reactor
PWSD	Public Water Supply District
QAPD	Quality Assurance Program Description
QC	Quality Control
QSL	Qualified Suppliers List
R	Radiation Exposure
RAP	Reliability Assurance Program
RAW	Risk Achievement Worth
RB	Reactor Building
RC	Release Consequence or Resonant Column
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
RCS	Reactor Coolant System
RCTS	Resonant Column Torsional Shear
RCx	Retro-Commissioning
RD	Rupture Disk Valve
REA	Rod Ejection Accident
REMP	Radiological Environmental Monitoring Program
RERP	Radiological Emergency Response Plan
RETS	Radiological Effluent Technical Specifications
RF	Reelfoot Fault
RFC	Requests for Clarification
RG	Regulatory Guide
RIMS	Regional Input-Output Modeling System
RLE	Review Level Earthquake
RMS	Records Management System
ROI	Region of Influence

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Table 1.1-1—{Acronyms Used in this Document}
(Page 10 of 12)

ROW	Right-of-Way
RPP	Radiation Protection Program
RPV	Reactor Pressure Vessel
RQD	Rock Quality Designation
RSB	Reactor Shield Building
RSE	Relative Standard Error
RSMo	Revised Statutes of Missouri
RTO	Regional Transmission Organization
RV	Relief Valve or Recreational Vehicle
RVT	Random Vibration Theory
RWSS	Raw Water Supply System
SA	Self Actuated
SACTI	Seasonal/Annual Cooling Tower
SAE	Statistically Adjusted End-Use
SAHRS	Severe Accident Heat Removal System
SAMA	Severe Accident Mitigation Alternatives
SAMDA	Severe Accident Mitigation Design Alternatives
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SAT	Systematic Approach to Training
SBO	Station Blackout
SBVSE	Safeguard Building Ventilation System
SCBA	Self-Contained Breathing Apparatus
SCC	Stress Corrosion Cracking
SCGT	Simple Cycle Gas Turbine
SCR	Stable Continental Region
SCS	Soil Conservation Service
SDP	Significance Determination Process
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SE	Safety Evaluation
SECPOP	Sector Population Land Fraction, and Economic Estimation Program
SEMA	State Emergency Management Agency
SFP	Spent Fuel Pool
SGTR	Steam Generator Tube Rupture
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SIS	Safety Injection System
SLOSH	Sea, Lake, and Overland Surges from Hurricanes
SOC	Standard Occupational Classification
SOG	Seismicity Owner's Group
SOP	Standard Operating Procedures
SOV	Solenoid-Operated Valve
SO_x	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasures
SPH	Standard Project Hurricane
SPT	Standard Penetration Test
SQG	Small Quantity Generator
SQPD	Seismic Qualification Data Package
SRP	Standard Review Plan

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Table 1.1-1—{Acronyms Used in this Document}
(Page 11 of 12)

SRSS	Square Root of the Sum of the Square
SSA	Sole Source Aquifer
SSCs	Structures, Systems, and Components
SSE	Safe Shutdown Earthquake
SSHAC	Senior Seismic Hazard Analysis Committee
SSI	Soil-Structure Interaction
STEL	Short-Term Exposure Limit
SVP/CNO	Senior Vice President/Chief Nuclear Officer
SW	Surface Water
SWAT	Special Weapons and Tactics
SWPPP	Stormwater Pollution Prevention Plan
SWW	Sanitary Waste Water
T&Q	Training and Qualification
TDH	Total Developed Head
TDS	Total Dissolved Solids
TE	Terrestrial Ecosystems
TEDE	Total Effective Dose Equivalent
TEMT	Transmission and Energy Markets Tariff
TES	Thermal Energy Storage
THL	Transient Hazard Level
TI	Technical Integrator or Turbine Island
TIP	Trial Implementation Project
TLD	Thermoluminescent Dosimeter
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TNT	Trinitrotoluene
TOC	Top of Concrete
TR	Topical Report
TRC	Total Recordable Cases
TRT	Test Review Team
TS	Technical Specifications
TSA	Temporary Storage Area
TSC	Technical Support Center
TWA	Time Weighted Average
TWh	Terawatt-Hours
UAC	Switchyard Control House
UB	Upper Bound
UBA	Switchgear Building
UBE	Auxiliary Power Transformer Area
UBF	Generator Transformer Area
UFL	Upper Flammability Limit
UFSAR	Updated Final Safety Analysis Report
UHRS	Uniform Hazard Response Spectra
UHS	Uniform Hazard Spectra or Ultimate Heat Sink
UMA	Turbine Building
UNOS	UniStar Nuclear Operating Services, LLC
UO2	Uranium Oxide
UPF	Essential Service Water Emergency Make-up System Pumphouse
UQA	Circulating Water Pump Building
USACE	U.S. Army Corps of Engineers

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Table 1.1-1—{Acronyms Used in this Document}
(Page 12 of 12)

USCS	Unified Sort Classification System
USDA	US Department of Agriculture
USEC	United States Enrichment Corporation
USEPA	U.S. Environmental Protection Agency
USFWS	U. S. Fish and Wildlife Services
USG	Fire Protection Building
USGS	U.S. Geological Survey
USNSN	U.S. National Seismograph Network
UTM	Universal Transverse Mercator
UTA	University of Texas at Austin
UTG	Central Gas Supply
UYF	Security Access Building
VBS	Vehicle Barrier System
VCP	Voluntary Cleanup Program
Vp	Compressional Wave Velocity
VOCs	Volatile Organic Compounds
VR	Volume Reduction
Vs	Shear-Wave Velocity
V&V	Verification & Validation
WET	Whole Effluent Toxicity
WHI	Waterloo Hydrogeologic, Inc.
WNW	West-Northwest
WOH	Weight of Hammer
WOR	Weight of Rod
WTP	Water Treatment Plant
WUS	Western United States
WVSZ	Wabash Valley Seismic Zone
WWTFs	Wastewater Treatment Facilities
ZPA	Zero Period Accelerations

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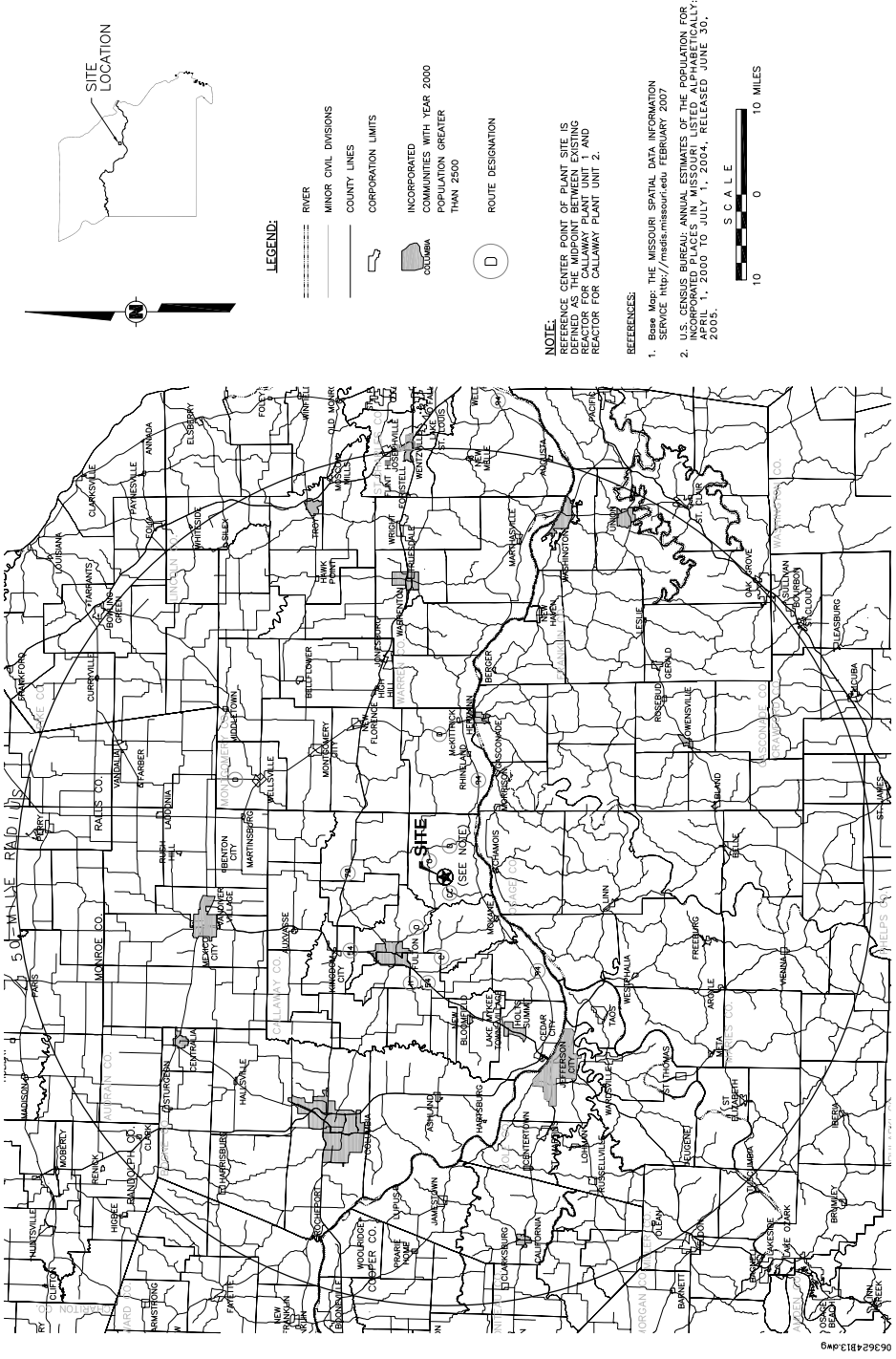

Figure 1.1-1—{50 mi (80 km) Surrounding Area}

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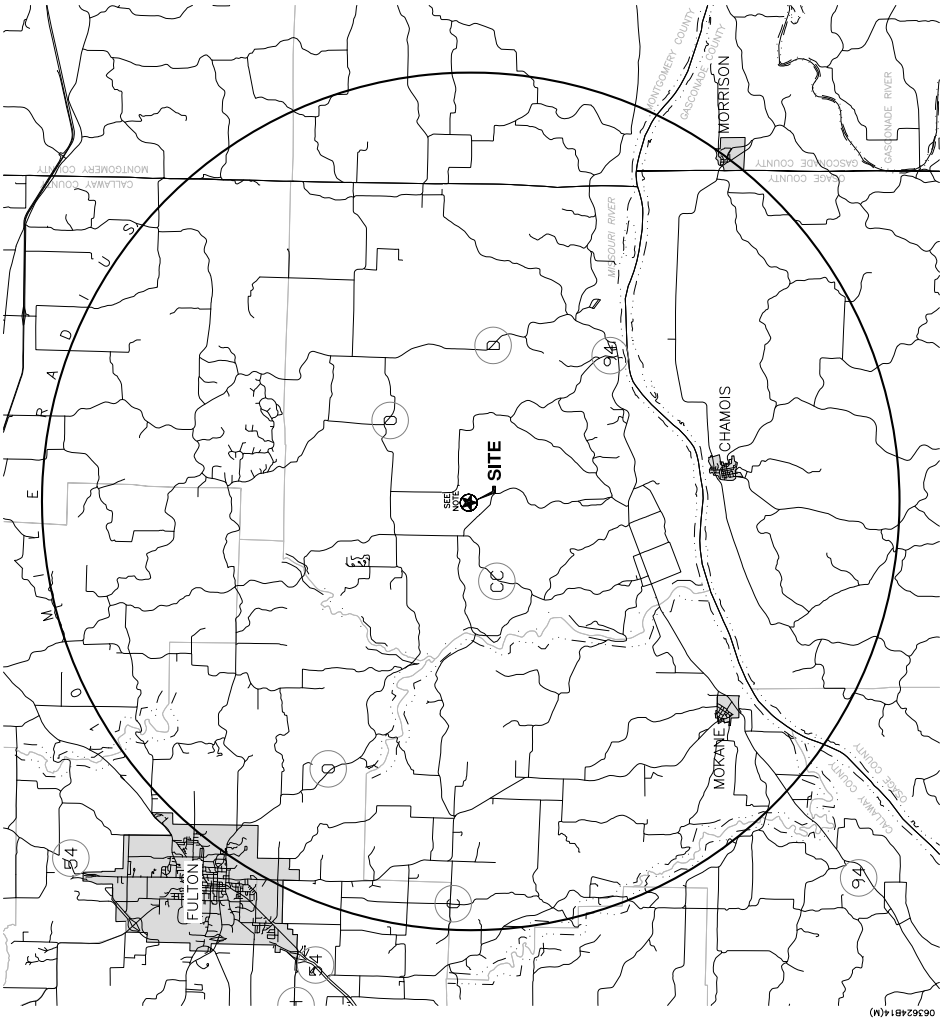

Figure 1.1-2—{10 mi (16 km) Surrounding Area}

FSAR: Chapter 1.0

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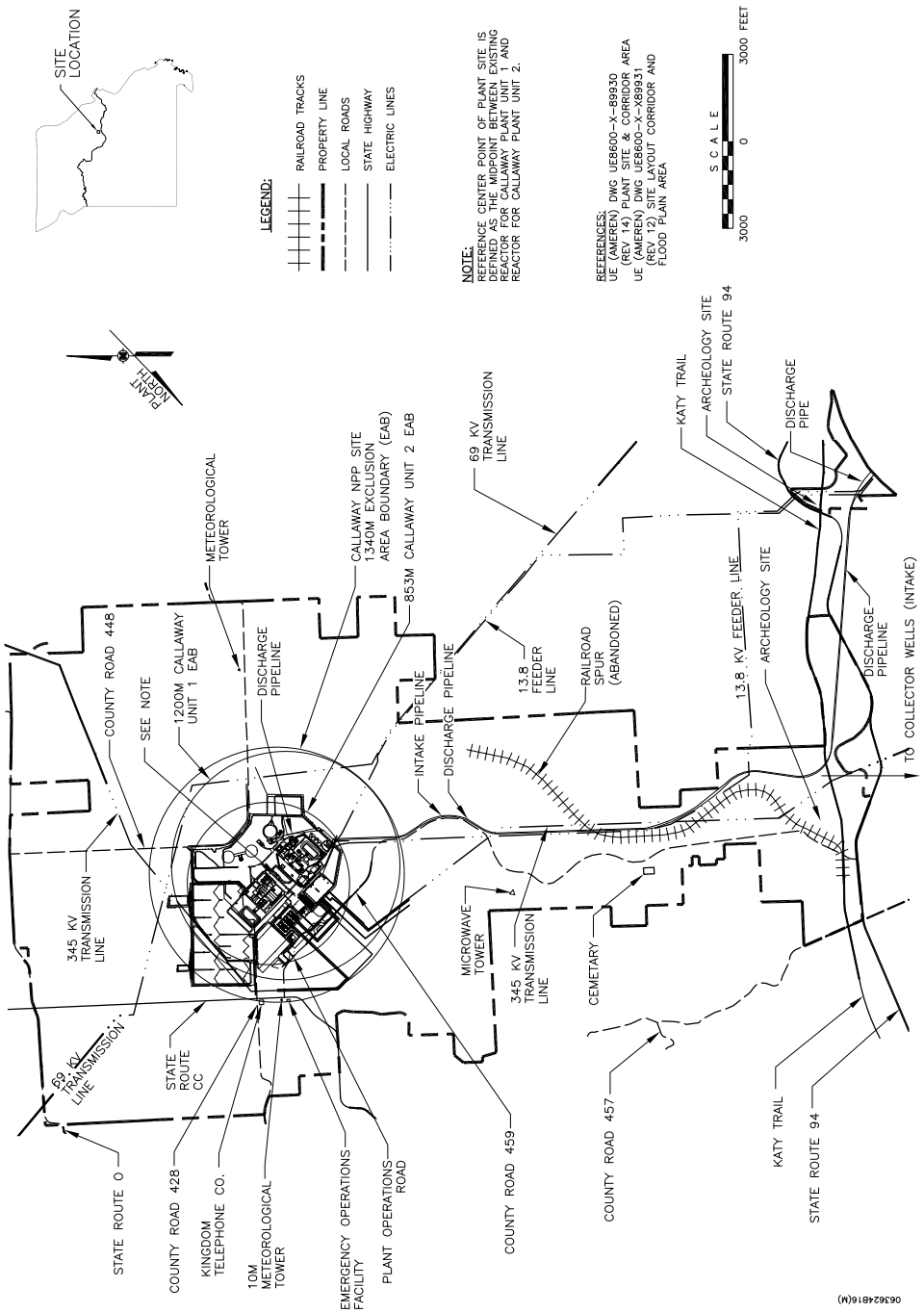

Figure 1.1-3— {Site Area Map}

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1.2 GENERAL PLANT DESCRIPTION

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 1.2:

A COL applicant that references the U.S. EPR design certification will identify those site-specific features of the plant likely to be of special interest because of their relationship to safety. The COL applicant will also highlight items such as unusual site characteristics, solutions to particularly difficult engineering, construction problems, and significant extrapolations in technology represented by the site specific design.

This COL Item is addressed as follows:

{There are no site-specific features of the plant considered to be of special interest because of their relationship to safety. There are no unusual site characteristics, and no particularly difficult engineering or construction problems, and no significant extrapolations in technology represented by the site specific design.}

1.2.1 PRINCIPAL DESIGN CRITERIA, OPERATING CHARACTERISTICS, AND SAFETY CONSIDERATIONS

No departures or supplements.

1.2.2 SITE DESCRIPTION

The U.S. EPR FSAR includes the following conceptual design information in Section 1.2.2 for the Turbine Building:

Turbine Building – [[Figures 1.2-28 through 1.2-49.]]

The above conceptual design information is addressed as follows:

An Alstom turbine generator design has been selected. This is the reference design reflected in U.S. EPR Section 10.1, 10.2, and 10.4.7. Figures in Section 1.2 of the U.S. EPR FSAR not identified as "Alternate" (i.e., Figures 1.2-28, 30, 32, 34, 36, 37, 40, 42, 43, 46, and 48) are incorporated by reference.

The U.S. EPR FSAR includes the following conceptual design information in Section 1.2.2 for the Access Building:

Access Building – [[Figures 1.2-50 through 1.2-58.]]

The above conceptual design information is addressed as follows:

The reference Access Building shown in U.S. EPR FSAR Figures 1.2-50 through 1.2-58 is incorporated by reference.

The U.S. EPR FSAR includes the following COL Item in Section 1.2.2:

A COL applicant that references the U.S. EPR design certification will provide a site-specific layout figure.

This COL Item is addressed as follows:

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The site specific layout is presented in Figure 1.1-3 showing the {Callaway Plant Unit 2 site and collector wells on the Missouri River.} An enlargement of the layout of the Nuclear and Turbine Building Islands is presented in Figure 1.2-1.

The U.S. EPR FSAR includes the following COL Item in Section 1.2.2:

> A COL applicant that references the U.S. EPR design certification will provide site-specific general arrangement drawings for the Turbine Building and Access Building.

This COL Item is addressed as follows:

The reference plant Turbine Building and Access Building are utilitzed. The general arrangement drawings provided in the U.S. EPR FSAR are incorporated by reference as discussed above.

1.2.3 PLANT DESCRIPTION

1.2.3.1 Introduction to the U.S. EPR Design and Building Arrangement

1.2.3.1.1 Overview

No departures or supplements.

1.2.3.1.2 Buildings and Arrangement

The U.S. EPR FSAR includes the following conceptual design information in Section 1.2.3.1.2 for the Turbine Building:

> Physical separation also protects the [[Turbine Building and Switchgear Building. The Turbine Building houses the components of the steam condensate main feedwater cycle, including the turbine-generator. This building is located in a radial position with respect to the Reactor Building, but is independent from the Nuclear Island (NI). The Turbine Building is further described in Section 3.7.2. The Switchgear Building, which contains the power supply, the instrumentation and controls (I&C) for the balance of plant, and the SBO diesel generators, is located next to the Turbine Building and is physically separate from the NI. The Switchgear Building is shown in Figure 1.2-3.]]

The above conceptual design information is addressed as follows:

The reference Turbine Building and Switchgear Building designs are utilized. The information as stated in the U.S. EPR FSAR is incorporated by reference.

1.2.3.2 Reactor Coolant System

No departures or supplements.

1.2.3.3 Engineered Safety Features and Emergency Systems

No departures or supplements.

1.2.3.4 Instrumentation and Control Systems

No departures or supplements.

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1.2.3.5 Electrical Systems

1.2.3.5.1 General

The U.S. EPR FSAR includes the following conceptual design information in Section 1.2.3.5.1:

[[For operational flexibility and reliability, the switchyard is configured in either a breaker-and-a-half or double breaker scheme.]]

The above conceptual design information is addressed as follows:

{The Callaway Plant Unit 2 switchyard is configured in a breaker and a half arrangement.}

1.2.3.5.2 Offsite Power

The U.S. EPR FSAR includes the following conceptual design information in Section 1.2.3.5.2:

[[Offsite power is provided from the switchyard to the onsite power systems through five three-winding auxiliary transformers. Two of the transformers are for safety-related power and three are for non-safety-related power. Two emergency auxiliary transformers provide the source for the onsite safety-related (Class 1E) buses of the emergency power supply system (EPSS). Each of these transformers will normally supply two of the four safety divisions, but each is sized to supply all four divisions in the event of a failure. Three normal auxiliary transformers provide power to the onsite non-safety buses of the normal power supply system (NPSS). These transformers are sized to supply all non-safety loads required for operation with only two of three transformers in operation.]]

The above conceptual design information is addressed as follows:

{The U.S. EPR FSAR description provided above is applicable to the Callaway Plant Unit 2 Offsite Power System and is incorporated by reference.}

1.2.3.5.3 Onsite Power System

No departures or supplements.

1.2.3.6 Power Conversion Systems

No departures or supplements.

1.2.3.7 Fuel Handling and Storage Systems

No departures or supplements.

1.2.3.8 Cooling Water and Other Auxiliary Systems

No departures or supplements.

1.2.3.9 Radioactive Waste Management Systems

No departures or supplements.

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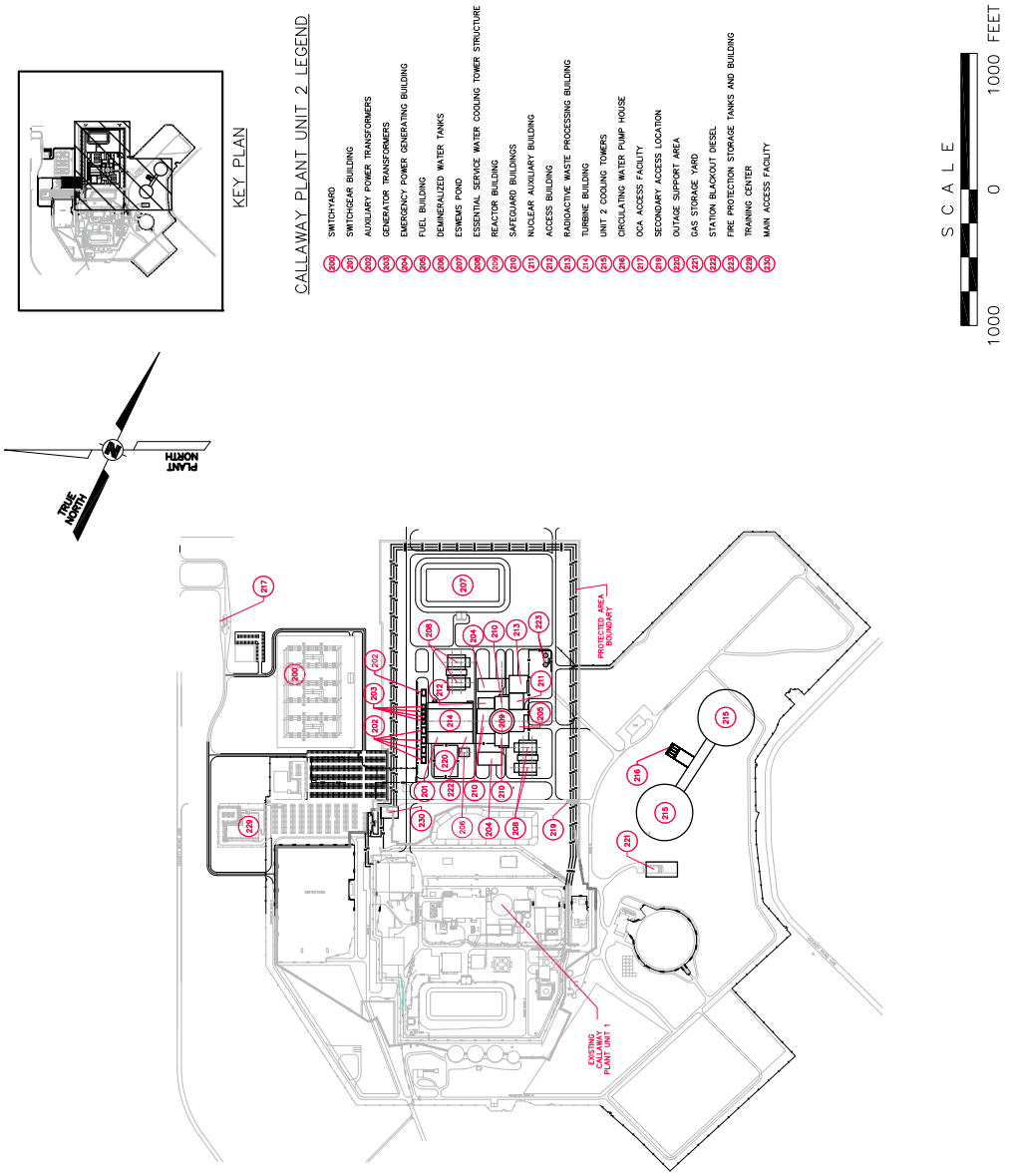

Figure 1.2-1—{Callaway Plant Unit 2 Nuclear and Turbine Building Island Layout}

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1.3 COMPARISONS WITH SIMILAR FACILITY DESIGNS

This section of the U.S. EPR FSAR is incorporated by reference.

1.4 IDENTIFICATION OF AGENTS AND CONTRACTORS

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

1.4.1 APPLICANT – PROGRAM MANAGER

{Union Electric Company, doing business as AmerenUE, is applying for a combined license to construct and operate the nuclear power plant to be known as Callaway Plant Unit 2. AmerenUe will be the owner, operator and licensee of Callaway Plant Unit 2. The combined license application for Callaway Plant Unit 2 references AREVA's U.S. Evolutionary Power Reactor (U.S. EPR), now undergoing design certification before the Nuclear Regulatory Commission.

AmerenUE is the second applicant to reference the U.S. EPR in an application for the combined license. The application to construct and operate Calvert Cliffs Nuclear Power Plant Unit 3 is the first and is the reference plant for the U.S. EPR. AmerenUE's Callaway Plant Unit 2 will likely be the third U.S. EPR to be built and operated in the United States.

AmerenUE will participate in the process for standardized engineering, procurement and construction for Callaway Plant Unit 2 and will operate Unit 2 in accordance with policies and procedures established and maintained by UniStar Nuclear Operating Services, LLC (UNOS). In association with UNOS, AmerenUE will benefit from being part of the fleet of nuclear plants which maintain strict standardization with regard to the U.S. EPR design certification, as well as licensing, engineering, construction, operations, maintenance, modification, and procurement for the U.S. EPR. UNOS will provide licensing services to AmerenUE.

Section 1.4.1.1 is added as a supplement to the U.S. EPR FSAR.}

1.4.1.1 {AmerenUE}

{AmerenUE, Missouri's largest electric utility, provides electric service to approximately 1.2 million customers across central and eastern Missouri, including the greater St. Louis area. AmerenUE serves 65 counties and 500 towns. More than half (55%) of AmerenUE's electric customers are located in the St. Louis metropolitan area.

AmerenUE operates one nuclear plant, four fossil fuel plants, fifteen combustion gas turbine or oil-fired facilities, and three hydroelectric plants. These plants provide a net generating capacity of more than 9,900 megawatts.

AmerenUE is the owner and operator of Callaway Plant Unit 2. Engineering responsibility, technical cognizance during design and construction and responsibility for operation rests with the Senior Vice President and Chief Nuclear Officer. Overall responsibility for the design, construction and operation of Callaway Plant Unit 2 rests with AmerenUE.}

1.4.2 OTHER CONTRACTORS AND PARTICIPANTS

The U.S. EPR FSAR includes the following COL Item in Section 1.4.2:

> A COL applicant that references the U.S. EPR design certification will identify the prime agents or contractors for the construction and operation of the nuclear power plant.

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This COL Item is addressed as follows:

Design responsibility for the {Callaway Plant Unit 2} U.S. EPR nuclear power plant resides with AREVA NP Inc. (AREVA NP) for the portions of the facility included in the design certification application. AREVA NP has headquarters in Lynchburg, Virginia, and major design organizations in Lynchburg, Virginia; Charlotte, North Carolina; and Marlborough, Massachusetts. AREVA NP is an AREVA and Siemens company. AREVA NP and its predecessor companies have designed light water reactors for over 40 years. As such, AREVA NP has extensive nuclear design experience in addition to maintaining fabrication facilities for fuel and major components in Europe and the United States. AREVA NP will provide additional services during conduct of startup testing.

UniStar Nuclear Operating Services was formed to be a licensee and to operate several U.S. EPR nuclear power plants in the United States. The principal offices of UniStar Nuclear Operating Services are located in Baltimore, Maryland.

{UniStar Nuclear Operating Services is organized under the laws of the State of Delaware pursuant to the Limited Liability Company Agreement of UniStar Nuclear Operating Services dated May 12, 2006. UNOS is a wholly owned subsidiary of UniStar Nuclear Holdings, LLC, an indirect joint venture between Constellation Energy Group, LLC and EDF Development, Inc.}

{Bechtel North American Power Corporation

Bechtel North American Power Corporation (Bechtel) provides design services for portions of the facility design not included in the U.S. EPR design certification (balance of plant) and is expected to be the prime contractor for the construction of Callaway Plant Unit 2. Bechtel has extensive architectural-engineering experience, and has participated in the design and construction of more than 150 nuclear power plants worldwide. Bechtel provides design assistance to AREVA NP which retains design responsibility for the U.S. EPR.

Burns & McDonnell

Burns & McDonnell (B&M) is the site architect engineer to provide engineering and architectural services for the plant systems and facilities which were not the responsibility of the standard plant architect/engineer. In general, the responsibilities of B&M included the site layout, the location of the power block, the design of yard and construction facilities, and the location and design of the circulating water systems.

Black & Veatch

Black & Veatch (B&V) provides specialty engineering services to AmerenUE to support construction of Callaway Plant Unit 2. For example, B&V prepared the Integrated Resource Plan for Callaway, and the design of the Emergency Makeup Water System pond and make-up water transfer system.

Alstom

Alstom is providing the design, fabrication, and delivery of the turbine generators, and provided technical assistance for installation, startup, and operation of this equipment. Alstom has a long history in the application of turbine generators for nuclear power plants.

Paul C. Rizzo & Associates

Paul C. Rizzo & Associates (Rizzo) provide services in the areas of geology, meteorology, demography, hydrology, aquatic and terrestrial aspects, population, land use, thermal and chemical effects and biological factors.}

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Other various agents and contractors provide specialized services to the project.

1.5 REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION

This section of the U.S. EPR FSAR is incorporated by reference.

1.6 MATERIAL REFERENCED

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 1.6:

> A COL applicant that references the U.S. EPR design certification will include any site-specific topical reports that are incorporated by reference as part of the COL application in Table 1.6-1.

This COL Item is addressed as follows:

Table 1.6-1 of this FSAR contains a list of topical reports submitted to the NRC to support this application.

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Table 1.6-1—Reports Referenced

Report No.	Title/Revision	Date Submitted to the NRC	FSAR Section
UN-TR-08-001	Spent and New Fuel Storage Analyses for U.S. EPR Topical Report, Revision 0	March 2008	9.1
NEI 07-08	Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA), Revision 0	September 2007	12.1.3
NEI 07-03	Generic FSAR Template Guidance for Radiation Protection Description, Revision 2	October 2007	12.5
NEI 06-13A	Template for an Industry Training Program Description, Revision 0	October 2007	13.2
{AmerenUE QAPD	Quality Assurance Program Description, Revision 1	August 2008 (Part 11A)	17.5}
NEI 07-02A	Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52, Revision 3	March 2008	17.6
NEI 07-09	Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description	February 26, 2008	11.5
NEI 07-10	Generic FSAR Template Guidance for Process Control Program (PCP) Description	February 26, 2008	11.4

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1.7 DRAWINGS AND OTHER DETAILED INFORMATION

This section of the FSAR is incorporated by reference with the following supplements.

1.7.1 ELECTRICAL AND INSTRUMENTATION AND CONTROL DRAWINGS

The U.S. EPR FSAR includes the following COL Item in Section 1.7.1:

> A COL applicant that references the U.S. EPR design certification will list additional site specific instrumentation and control functional diagrams and electrical one-line diagrams included in the COL FSAR in Table 1.7-1 and supplement the figure legends, if applicable.

This COL Item is addressed as follows:

Table 1.7-1 contains a list of site specific instrumentation and control functional diagrams and electrical one-line diagrams included in the COL FSAR.

1.7.2 PIPING AND INSTRUMENTATION DIAGRAMS

The U.S. EPR FSAR includes the following COL Item in Section 1.7.2:

> A COL applicant that references the U.S. EPR design certification will list additional site specific P&IDs included in the COL FSAR in Table 1.7-2 and supplement the figure legend, if applicable.

This COL Item is addressed as follows:

A list of site specific P&IDs included in the {Callaway Plant Unit 2} FSAR is presented in Table 1.7-2.

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Table 1.7-1—{I&C Functional and Electrical One Line Diagrams**}**

FSAR Figure Number	Title
8.1-1	Callaway Plant 345 kV Circuit Corridors
8.2-1	Callaway Plant Layout
8.2-2	Callaway Plant Switchyard Single Line Diagram
8.3-1	Emergency Power Supply System Single Line Diagram
8.3-2	Normal Power Supply System Single Line Diagram
8.3-3	Callaway Site Grounding

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Table 1.7-2—{Piping and Instrumentation Diagrams**}**

FSAR Figure Number	Title
9.2-1	Potable Water System
9.2-2	Sanitary Waste Water System
9.2-3	Essential Service Water Emergency Makeup System
9.2-4	Schematic of Raw Water/Treated Water Supply
9.4-1	ESWEMS Pumphouse Ventilation System
10.4-2	Circulating Water System P& ID (Turbine Building)
10.4-5	Circulating Water System P& ID (Cooling Towers)
10.4-6	Circulating Water System P& ID (Blowdown Flowpath)

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1.8 INTERFACES WITH STANDARD DESIGNS AND EARLY SITE PERMITS

This section of the U.S. EPR FSAR is incorporated by reference with the following departures and/or supplements.

The U.S. EPR FSAR includes the following COL Item in Section 1.8:

> A COL applicant that references the U.S. EPR design certification will describe where the interface requirements are satisfied in the COL Final Safety Analysis (FSAR) to demonstrate compatibility with the U.S. EPR design.

This COL Item is addressed as follows:

Interface requirements for systems, structures, and components (SSCs) that relate to specific mechanical, electrical, nuclear, or structural systems are identified in appropriate sections of the FSAR. Table 1.8-1 provides a cross-reference to the description of these interfaces.

1.8.1 COL INFORMATION ITEMS

The U.S. EPR FSAR includes the following COL Item in Section 1.8.1:

> A COL applicant that references the U. S. EPR design certification will identify the FSAR section, or provide a list, that demonstrates how the COL information items have been addressed.

This COL Item is addressed as follows:

The text of the COL Items and COL No. identifier listed in Table 1.8-2 of the U.S. EPR FSAR are presented in Table 1.8-2. For each COL Item listed, the corresponding section of this FSAR that addresses the COL Item is identified. Additional explanatory comments are provided as necessary or appropriate.

1.8.2 DEPARTURES

The U.S. EPR FSAR includes the following COL Item in Section 1.8.2:

> A COL applicant that references the U. S. EPR design certification will provide a list of any departures from the FSAR in the COL FSAR.

This COL Item is addressed as follows:

{The list of departures from the U.S. EPR FSAR is as follows:

Technical Specifications (Setpoint Control Program, Error Corrections to Limiting Trip Setpoints and Incorporation of Site-Specific Information)	FSAR 16.0 and COLA Part 4
Callaway Plant Unit 2 site-specific Safe Shutdown Earthquake (SSE)	FSAR 2.5.2.6
Callaway Plant Unit 2 Idealized Site Soil profiles	FSAR 2.5.2.6
In-Structure Response Spectra (ISRS)	FSAR 2.5.2.6
TSC/OSC Location	FSAR 13.0 and COLA Part 5

Justification for these departures is presented in Part 7 of the COL application.}

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Table 1.8-1—FSAR Sections that Demonstrate Conformance to U.S. EPR FSAR Interface Requirements

Item No.	Interface	Interface Type	FSAR Section
1-1	Switchgear Building	U.S. EPR Interface	1.2, 8.3, 8.4
1-2	Access Building	U.S. EPR Interface	1.2, 3.7.2
1-3	Turbine Building	U.S. EPR Interface	1.2, 3.7.2
1-4	Fire Protection Storage Tanks and Building	U.S. EPR Interface	1.2, 3.7.2
2-1	Envelope of U.S. EPR site related design	Site Parameter	2.0, Table 2.0-1
2-2	Consequences of potential hazards from nearby industrial, transportation and military facilities	Site Parameter	2.2
2-3	Site-specific χ/Q values based on site-specific meteorological data at the exclusion area boundary (EAB), low population zone (LPZ), and control room	Site Parameter	2.3
2-4	Site-specific seismic parameters	Site Parameter	2.5, 3.7
2-5	Soil conditions and profiles	Site Parameter	2.5
2-6	Bearing pressure of soil beneath the nuclear island basemat	Site Parameter	2.5
2-7	Foundation settlements	Site Parameter	2.5
3-1	Missiles generated from nearby facilities	Site Parameter	3.5
3-2	Missiles generated by tornadoes or extreme winds	Site Parameter	3.5
3-3	Aircraft hazards	Site Parameter	3.5
3-4	Site-specific loads that lie within the standard plant design envelope for Seismic Category I structures	Site Parameter	3.8
3-5	Buried conduit duct banks, pipe ducts, and piping	U.S. EPR Interface	3.8
6-1	Toxic gas detectors for the main control room	U.S. EPR Interface	6.4, 9.4.1
8-1	Off-site AC power transmission system connections to the switchyard and the connection to the plant power distribution system	U.S. EPR Interface	8.2
8-2	On-site AC power transmission system connections to the switchyard and the connection to the plant power distribution system	U.S. EPR Interface	8.3
8-3	Auxiliary power and generator transformer areas	U.S. EPR Interface	8.2
8-4	Lightning protection and grounding system grid	U.S. EPR Interface	8.3.1
9-1	New fuel and spent fuel storage racks	U.S. EPR Interface	9.1.1, 9.1.2
9-2	Provide support systems such as makeup water, blowdown and chemical treatment (to control biofouling) for the UHS	U.S. EPR Interface	9.2.5
9-3	Raw water system	U.S. EPR Interface	9.2.9
9-4	Fire water distribution system	U.S. EPR Interface	9.5.1
10-1	Design details for circulating water system including makeup water, and water treatment	U.S. EPR Interface	10.4.5
11-1	Process Control program and program aspects of process and effluent monitoring and sampling	U.S. EPR Interface	11.5
13-1	Site-specific information for administrative, operating, emergency, maintenance, and other operating procedures.	U.S. EPR Interface	13.5
13-2	Site-specific emergency plan	U.S. EPR Interface	13.3
13-3	Site-specific security assessment and Physical Security Plan	U.S. EPR Interface	13.6
14-1	Site-specific information for development of the initial test program	U.S. EPR Interface	14.2

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Table 1.8-2—{FSAR Sections that Address COL Items}

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Item No.	Description	Section
1.1-1	A COL applicant that references the U.S. EPR design certification and proposes a multi-unit license application will provide the changes and additional information needed to license a multi-unit plant.	1.1
1.1-2	A COL applicant that references the U.S. EPR design certification will identify the specific plant site location.	1.1.1
1.1-3	A COL applicant that references the U.S. EPR design certification will provide the estimated schedules for completion of construction and commercial operation.	1.1.5
1.2-1	A COL applicant that references the U.S. EPR design certification will identify those site specific features of the plant likely to be of special interest because of their relationship to safety. The COL applicant will also highlight items such as unusual site characteristics, solutions to particularly difficult engineering, construction problems, and significant extrapolations in technology represented by the site specific design.	1.2
1.2-2	A COL applicant that references the U.S. EPR design certification will provide a site-specific layout figure.	1.2.2
1.2-3	A COL applicant that references the U.S. EPR design certification will provide site-specific general arrangement drawings for the Turbine Building and Access Building.	1.2.2
1.4-1	A COL applicant that references the U.S. EPR design certification will identify the prime agents or contractors for the construction and operation of the nuclear power plant.	1.4.2
1.6-1	A COL applicant that references the U.S. EPR design certification will include any site-specific topical reports that are incorporated by reference as part of the COL application in Table 1.6-1.	1.6
1.7-1	A COL applicant that references the U.S. EPR design certification will list additional site specific instrumentation and control functional diagrams and electrical one-line diagrams included in the COL FSAR in Table 1.7-1 and supplement the figure legends, if applicable.	1.7.1
1.7-2	A COL applicant that references the U.S. EPR design certification will list additional site specific P&IDs included in the COL FSAR in Table 1.7-2 and supplement the figure legend, if applicable.	1.7.2
1.8-1	A COL applicant that references the U.S. EPR design certification will describe where the interface requirements are satisfied in the COL FSAR to demonstrate compatibility with the U.S. EPR design.	1.8
1.8-2	A COL applicant that references the U. S. EPR design certification will identify the FSAR section, or provide a list, that demonstrates how the COL information items have been addressed.	1.8.1
1.8-3	A COL applicant that references the U. S. EPR design certification will provide a list of any departures from the FSAR in the COL FSAR.	1.8.2
1.9-1	A COL applicant that references the U.S. EPR design certification will review and address the conformance with Regulatory Criteria in effect six months before the docket date of the COL application for the site-specific portions and operational aspects of the facility design.	1.9
2.0-1	A COL applicant that references the U.S. EPR design certification will compare site-specific data to the design parameter data in Table 2.1-1. If the specific data for the site falls within the assumed design parameter data and characteristics in Table 2.1-1, then the U.S. EPR standard design is bounding for the site. For site-specific design parameter data or characteristics that are outside the bounds of the assumptions presented in Table 2.1-1, the COL applicant will confirm that the U.S. EPR design acceptably meets any additional requirements that may be imposed by the more limiting site specific design parameter data or characteristic, and that the design maintains conformance to the design commitments and acceptance criteria described in this FSAR	2.0
2.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information related to site location and description, exclusion area authority and control, and population distribution.	2.1
2.2-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information related to the identification of potential hazards stemming from nearby industrial, transportation, and military facilities within the site vicinity, including an evaluation of potential accidents (such as explosions, toxic chemicals, and fires).	2.2
2.2-2	A COL applicant that references the U.S. EPR design certification will provide information concerning site- specific evaluations to determine the consequences that potential accidents at nearby industrial, transportation, and military facilities could have on the site. The information provided by the COL applicant will include specific changes made to the U.S. EPR design to qualify the design of the site against potential external accidents with an unacceptable probability of severe consequences.	2.2.3

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Table 1.8-2—{FSAR Sections that Address COL Items}

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2.3-1	If A COL applicant that references the U.S. EPR design certification identifies site-specific meteorology values outside the range of the design parameters in Table 2-1, then the COL applicant will demonstrate the acceptability of the site-specific values in the appropriate sections of the Combined License application.	2.3
2.3-2	A COL applicant that references the U.S. EPR design certification will provide site-specific characteristics for regional climatology.	2.3.1
2.3-3	A COL applicant that references the U.S. EPR design certification will provide site-specific characteristics for local meteorology.	2.3.2
2.3-4	A COL applicant that references the U.S. EPR design certification will provide the site-specific, onsite meteorological measurement program.	2.3.3
2.3-5	A COL applicant that references the U.S. EPR design certification will provide a description of the atmospheric dispersion modeling used in evaluating potential design basis events to calculate concentrations of hazardous materials (e.g., flammable or toxic clouds) outside building structures resulting from the onsite and/or offsite airborne releases of such materials.	2.3.4
2.3-6	A COL applicant that references the U.S. EPR design certification will confirm that site specific χ/Q values, based on site-specific meteorological data, are bounded by those specified in Table 2-1 at the EAB and LPZ and by Table 2.3-1 at the control room. For site-specific χ/Q values that exceed the bounding χ/Q values, a COL applicant that references the U.S. EPR design certification will demonstrate that the radiological consequences associated with the controlling design basis accident continue to meet the dose reference values given in 10 CFR 50.34 and the control room operator dose limits given in GDC 19 using site-specific χ/Q values.	2.3.4.2
2.3-7	A COL applicant that references the U.S. EPR design will provide χ/Q values for each cumulative frequency distribution which exceeds the median value (50% of the time) as part of the assessment of the postulated impact of an accident on the environment.	2.3.4.2.2
2.3-8	A COL applicant that references the U.S. EPR design certification will provide the site-specific, long-term diffusion estimates for routine releases. In developing this information, the COL applicant should consider the guidance provided in RG 1.23, RG 1.109, RG 1.111, and RG 1.112.	2.3.5
2.3-9	A COL applicant that references the U.S EPR design certification will also provide estimates of annual average atmospheric dispersion (χ/Q values) and deposition (D/Q values) for 16 radial sectors to a distance of 50 miles (80 km) from the plant as part of its environmental assessment.	2.3.5
2.3-10	A COL applicant that references the U.S. EPR design certification will describe the means for providing UHS makeup sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30 day period consistent with RG 1.27.	2.3.1.2
2.4-1	A COL applicant that references the U.S. EPR design certification will provide a site-specific description of the hydrologic characteristics of the plant site.	2.4.1
2.4-2	A COL applicant that references the U.S. EPR design certification will identify site-specific information related to flood history, flood design considerations, and effects of local intense precipitation.	2.4.2
2.4-3	A COL applicant that references the U.S. EPR design certification will provide site-specific information to describe the probable maximum flood of streams and rivers and the effect of flooding on the design.	2.4.3
2.4-4	A COL applicant that references the U.S. EPR design certification will verify that the site specific potential hazards to the safety-related facilities due to the seismically-induced failure of upstream and downstream water control structures are within the hydrogeologic design basis.	2.4.4
2.4-5	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the probable maximum surge and seiche flooding and determine the extent to which safety-related plant systems require protection. The applicant will also verify that the site-parameter envelope is within the design maximum flood level, including consideration of wind effects.	2.4.5
2.4-6	A COL applicant that references the U.S. EPR design will provide site-specific information and determine the extent to which safety-related facilities require protection from tsunami effects.	2.4.6
2.4-7	A COL applicant that references the U.S. EPR design certification will provide site-specific information regarding ice effects and design criteria for protecting safety-related facilities from ice-produced effects and forces with respect to adjacent water bodies.	2.4.7
2.4-8	A COL applicant that references the U.S. EPR design certification will evaluate the potential for freezing temperatures that may affect the performance of the ultimate heat sink makeup, including the potential for frazil and anchor ice, maximum ice thickness, and maximum cumulative degree-days below freezing.	2.4.7

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Table 1.8-2—{FSAR Sections that Address COL Items}

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2.4-9	A COL applicant that references the U.S. EPR design certification will provide site-specific information and describe the design basis for cooling water canals and reservoirs used for makeup to the UHS cooling tower basins.	2.4.8
2.4-10	A COL applicant that references the U.S. EPR design certification will provide site-specific information and demonstrate that in the event of upstream diversion or rerouting of the source of cooling water, alternate water supplies will be available to safety-related equipment.	2.4.9
2.4-11	A COL applicant that references the U.S. EPR design certification will use site-specific information to compare the location and elevations of safety-related facilities, and of structures and components required for protection of safety-related facilities, with the estimated static and dynamic effects of the design basis flood conditions.	2.4.10
2.4-12	A COL applicant that references the U.S. EPR design certification will identify natural events that may reduce or limit the available cooling water supply, and will verify that an adequate water supply exists for operation or shutdown of the plant in normal operation, anticipated operational occurrences, and in low water conditions.	2.4.11
2.4-13	A COL applicant that references the U.S. EPR design certification will provide site-specific information to identify local and regional groundwater reservoirs, subsurface pathways, onsite use, monitoring or safeguard measures, and to establish the effects of groundwater on plant structures.	2.4.12
2.4-14	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the ability of the groundwater and surface water environment to delay, disperse, dilute, or concentrate accidental radioactive liquid effluent releases, regarding the effects that such releases might have on existing and known future uses of groundwater and surface water resources.	2.4.13
2.4-15	A COL applicant that references the U.S. EPR design certification will describe any emergency measures required to implement flood protection in safety-related facilities and to verify there is an adequate water supply for shutdown purposes.	2.4.14
2.5-1	A COL applicant that references the U.S. EPR design certification will use site-specific information to investigate and provide data concerning geological, seismic, geophysical, and geotechnical information.	2.5.1
2.5-2	A COL applicant that references the U.S. EPR design certification will review and investigate site-specific details of seismic, geophysical, geological, and geotechnical information to determine the safe shutdown earthquake (SSE) ground motion for the site and compare site specific ground motion to the Certified Seismic Design Response Spectra (CSDRS) for the U.S. EPR.	2.5.2
2.5-3	A COL applicant that references the U.S. EPR design certification will verify that the site specific seismic parameters are enveloped by the CSDRS (anchored at 0.3 g PGA) and the 10 generic soil profiles discussed in Sections 2.5.2 and 3.7.1 and summarized in Table 3.7.1-6.	2.5.2.6
2.5-4	A COL applicant that references the U.S. EPR design certification will verify that site-specific foundation soils beneath the foundation basemats of Seismic Category I structures have the capacity to support the bearing pressure with a factor of safety of 3.0 under static conditions.	2.5.4.10.1
2.5-5	A COL applicant that references the U.S. EPR design certification will investigate site-specific surface and subsurface geologic, seismic, geophysical, and geotechnical aspects within 25 miles around the site and evaluate any impact to the design. The COL applicant will demonstrate that no capable faults exist at the site in accordance with the requirements of 10 CFR 100.23 and of 10 CFR 50, Appendix S. If non-capable surface faulting is present under foundations for safety-related structures, the COL applicant will demonstrate that the faults have no significant impact on the structural integrity of safety-related structures, systems, or components.	2.5.3
2.5-6	A COL applicant that references the U.S. EPR design certification will present site-specific information about the properties and stability of soils and rocks that may affect the nuclear power plant facilities under both static and dynamic conditions, including the vibratory ground motions associated with the CSDRS and the site specific SSE.	2.5.4
2.5-7	A COL applicant that references the U.S. EPR design certification will verify that the differential settlement value of ½ in per 50 ft in any direction across the foundation basemat of a Seismic Category I structure is not exceeded. Settlement values larger than this may be demonstrated acceptable by performing additional site-specific evaluations.	2.5.4.10.2
2.5-8	A COL applicant that references the U.S. EPR design certification will evaluate site-specific information concerning the stability of earth and rock slopes, both natural and manmade (e.g., cuts, fill, embankments, dams, etc.), of which failure could adversely affect the safety of the plant.	2.5.5

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Table 1.8-2—{FSAR Sections that Address COL Items}

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2.5-9	A COL applicant that references the U.S. EPR design certification will reconcile the site specific soil properties with those used for design of U.S. EPR Seismic Category I structures and foundations described in Section 3.8.	2.5.4.2
2.5-10	A COL applicant that references the U.S. EPR design certification will investigate and determine the uniformity of the underlying layers of site specific soil conditions beneath the foundation basemats. The classification of uniformity or non-uniformity will be established by a geotechnical engineer.	2.5.4.10.3
3.1-1	A COL applicant that references the U.S. EPR design certification will identify the site-specific QA Program Plan that demonstrates compliance with GDC-1.	3.1.1.1.1
3.2-1	A COL applicant that references the U.S. EPR design certification will identify the seismic classification of applicable site-specific SSCs that are not identified in Table 3.2.2-1.	3.2.1
3.2-2	A COL applicant that references the U.S. EPR design certification will identify the quality group classification of applicable site-specific SSCs important to safety that are not identified in Table 3.2.2-1.	3.2.2
3.3-1	A COL applicant that references the U.S. EPR design certification will determine site-specific wind and tornado design parameters and compare these to the standard plant criteria. If the site-specific wind and tornado parameters are not bounded, then the COL applicant will evaluate the design for site-specific wind and tornado events and demonstrate that these loadings will not adversely affect the ability of safety-related structures to perform their safety functions during or after such events.	3.3
3.3-2	A COL applicant that references the U.S. EPR design certification will demonstrate that failure of site-specific structures or components not included in the U.S. EPR standard plant design, and not designed for wind loads, will not affect the ability of other structures to perform their intended safety functions.	3.3.1
3.3-3	A COL applicant that references the U.S. EPR design certification will demonstrate that failure of site-specific structures or components not included in the U.S. EPR standard plant design, and not designed for tornado loads, will not affect the ability of other structures to perform their intended safety functions.	3.3.2
3.4-1	A COL applicant that references the U.S. EPR design certification will confirm the potential site specific external flooding events are bounded by the U.S. EPR design basis flood values or otherwise demonstrate that the design is acceptable.	3.4.3.2
3.4-2	A COL applicant that references the U.S. EPR design certification will perform a flooding analysis for the ultimate heat sink makeup water intake structure based on the site-specific design of the structures and the flood protection concepts provided herein.	3.4.3.10
3.4-3	A COL applicant that references the U.S. EPR design certification will define the need for a site-specific permanent dewatering system.	3.4.3.11
3.5-1	A COL applicant that references the U.S. EPR design certification will describe controls to confirm that unsecured maintenance equipment, including that required for maintenance and that are undergoing maintenance, will be removed from containment prior to operation, moved to a location where it is not a potential hazard to SSCs important to safety, or seismically restrained to prevent it from becoming a missile.	3.5.1.2.3
3.5-2	A COL applicant that references the U.S. EPR design certification will confirm the evaluation of the probability of turbine missile generation for the selected turbine generator, P1, is less than 1 x 10-4 for turbine-generators favorably oriented with respect to containment.	3.5.1.3
3.5-3	A COL applicant that references the U.S. EPR design certification will assess the effect of potential turbine missiles from turbine generators within other nearby or co-located facilities.	3.5.1.3
3.5-4	A COL applicant that references the U.S. EPR design certification will evaluate the potential for other missiles generated by natural phenomena, such as hurricanes and extreme winds, and their potential impact on the missile protection design features of the U.S. EPR.	3.5.1.4
3.5-5	A COL applicant that references the U.S. EPR design certification will evaluate the potential for site proximity explosions and missiles generated by these explosions for their potential impact on missile protection design features.	3.5.1.5
3.5-6	A COL applicant that references the U.S. EPR design certification will evaluate site-specific aircraft hazards and their potential impact on plant SSCs.	3.5.1.6
3.5-7	For sites with surrounding ground elevations higher than plant grade, a COL applicant that references the U.S. EPR design certification will confirm that automobile missiles cannot be generated within a 0.5 mile radius of safety-related SSCs that would lead to impact higher than 30 ft above plant grade.	3.5.1.4
3.6-1	A COL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to this analysis.	3.6.1

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Table 1.8-2—{FSAR Sections that Address COL Items}

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3.6-2	A COL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to this analysis.	3.6.2.1
3.6-3	A COL applicant that references the U.S. EPR design certification will confirm that the design LBB analysis remains bounding for each piping system and provide a summary of the results of the actual as-built plant specific LBB analysis, including material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms.	3.6.3
3.6-4	A COL applicant that references the U.S. design certification will provide diagrams showing the final as-designed configurations, locations, and orientations of the pipe whip restraints in relation to break locations in each piping system.	3.6.2.5.1
3.7-1	A COL applicant that references the U.S. EPR design certification will confirm that the site specific seismic response is within the parameters of section 3.7 of the U.S. EPR standard design.	3.7.2
3.7-2	A COL applicant that references the US EPR design certification will provide the site-specific separation distances for the access building and turbine building.	3.7.2.8
3.7-3	A COL applicant that references the U.S. EPR design certification will provide a description of methods used for seismic analysis of site-specific Category I concrete dams, if applicable.	3.7.3.13
3.7-4	A COL applicant that references the U.S. EPR design certification will determine whether essentially the same seismic response from a given earthquake is expected at each of the units in a multi-unit site or instrument each unit. In the event that only one unit is instrumented, annunciation shall be provided to each control room.	3.7.4.2
3.7-5	A COL applicant that references the U.S. EPR design certification will determine if a suitable location exists for the free-field acceleration sensor. The mounting location must be such that the effects associated with surface features, buildings, and components on the recordings of ground motion are insignificant. The acceleration sensor must be based on material representative of that upon which the Nuclear Island (NI) and other Seismic Category I structures are founded.	3.7.4.2.1
3.7-6	A COL applicant that references the US EPR design certification will provide the seismic design basis for the sources of fire protection water supply for safe plant shutdown in the event of a SSE.	3.7.2.8
3.8-1	A COL applicant that references the U.S. EPR design certification will confirm that site specific loads lie within the standard plant design envelope for the Reactor Containment Building, or perform additional analyses to verify structural adequacy.	3.8.1.3
3.8-2	A COL applicant that references the U.S. EPR design certification will describe any differences between the standard plant layout and design of Seismic Category I structures required for site-specific conditions.	3.8.4.1
3.8-3	A COL applicant that references the U.S. EPR design certification will confirm that site specific loads lie within the standard design envelope for other Seismic Category I structures, or perform additional analyses to verify structural adequacy.	3.8.4.3
3.8-4	A COL applicant that references the U.S. EPR design certification will provide a description of Seismic Category I buried conduit and duct banks.	3.8.4.1.8
3.8-5	A COL applicant that references the U.S. EPR design certification will provide a description of Seismic Category I buried pipe and pipe ducts.	3.8.4.1.9
3.8-6	A COL applicant that references the U.S. EPR design certification will confirm that site specific loads lie within the standard design envelope for RB internal structures, or perform additional analyses to verify structural adequacy.	3.8.3.3
3.8-7	A COL applicant that references the U.S. EPR design certification will confirm that site-specific conditions for Seismic Category I buried conduit, electrical duct banks, pipe, and pipe ducts satisfy the requirements specified in Section 3.8.4.4.5 and those specified in AREVA NP Topical Report ANP-10264(NP), U.S. EPR Piping Analysis and Support Design, September 2006.	3.8.4.5
3.8-8	A COL applicant that references the U.S. EPR design certification will address site-specific Seismic Category I structures that are not described in this section.	3.8.4.1
3.8-9	A COL applicant that references the U.S. EPR design certification will describe site-specific foundations for Seismic Category I structures that are not described in this section.	3.8.5.1
3.8-10	A COL applicant that references the U.S. EPR design certification will evaluate site-specific methods for shear transfer between the foundation basemats and underlying soil for soil parameters that are not within the envelope specified in Section 2.5.4.2.	3.8.5.5
3.8-11	A COL applicant that references the U.S. EPR design certification will evaluate and identify the need for the use of waterproofing membranes and epoxy coated rebar based on site-specific groundwater conditions.	3.8.5.6.1

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3.8-12	A COL applicant that references the U.S. EPR design certification will describe the program to examine inaccessible portions of below-grade concrete structures for degradation and monitoring of groundwater chemistry.	3.8.5.7
3.8-13	A COL applicant that references the U.S. EPR design certification will identify if any site-specific settlement monitoring requirements are required for Seismic Category I foundations based on site-specific soil conditions.	3.8.5.7
3.8-14	A COL applicant that references the U.S. EPR design certification will describe the design and analysis procedures used for buried conduit and duct banks, and buried pipe and pipe ducts.	3.8.4.4.5
3.8-15	A COL applicant that references the U.S. EPR design certification will use results from site specific investigations to determine the routing of buried pipe and pipe ducts.	3.8.4.4.5
3.8-16	A COL applicant that references the U.S. EPR design certification will perform geotechnical engineering analyses to determine if the surface load will cause lateral and/or vertical displacement of bearing soil for the buried pipe and pipe ducts and consider the effect of wide or extra heavy loads.	3.8.4.4.5
3.9-1	A COL applicant that references the U.S. EPR design certification will submit the results from the vibration assessment program for the U.S. EPR RPV internals, in accordance with RG 1.20.	3.9.2.4
3.9-2	A COL applicant that references the U.S. EPR design certification will prepare the design specifications and design reports for ASME Class 1, 2, and 3 components, piping, supports and core support structures that comply with and are certified to the requirements of Section III of the ASME Code.	3.9.3
3.9-3	A COL applicant that references the U.S. EPR design certification will examine the feedwater line welds after hot functional testing prior to fuel loading and at the first refueling outage, in accordance with NRC Bulletin 79-13. A COL applicant that references the U.S. EPR design certification will report the results of inspections to the NRC, in accordance with NRC Bulletin 79-13.	3.9.3.1.1
3.9-4	As noted in ANP-10264(NP), A COL applicant that references the U.S. EPR design certification will confirm that thermal deflections do not create adverse conditions during hot functional testing.	3.9.3.1.1
3.9-5	As noted in ANP-10264(NP), should a COL applicant that references the U.S. EPR design certification find it necessary to route Class 1, 2, and 3 piping not included in the U.S. EPR design certification so that it is exposed to wind and tornadoes, the design must withstand the plant design-basis loads for this event.	3.9.3.1.1
3.9-6	A COL applicant that references the US EPR design certification will identify any additional site-specific valves in Table 3.9.6-2 to be included within the scope of the IST program.	3.9.6.3
3.9-7	A COL applicant that references the U.S. EPR design certification will submit the preservice testing (PST) program and IST program for pumps, valves, and snubbers as required by 10 CFR 50.55a.	3.9.6
3.9-8	A COL applicant that references the US EPR design certification will identify any additional site-specific pumps in Table 3.9.6-1 to be included within the scope of the IST program.	3.9.6.2
3.9-9	COL applicant that references the U.S. EPR design certification will either use a piping analysis program based on the computer codes described in Section 3.9.1 and Appendix 3C or will implement an NRC-approved benchmark program using models specifically selected for the U.S. EPR.	3.9.1.2
3.9-10	Pipe stress and support analysis will be performed by a COL applicant that references the U.S. EPR design certification.	3.9.1.2
3.9-11	A COL applicant that references the U.S. EPR design certification will provide a summary of the maximum total stress, deformation (where applicable), and cumulative usage factor values for each of the component operating conditions for ASME Code Class 1 components. For those values that differ from the allowable limits by less than 10%, the COL applicant will provide the contribution of each of the loading categories (e.g., seismic, pipe rupture, dead weight, pressure, and thermal) to the total stress for each maximum stress value identified in this range.	3.9.3.1
3.9-12	A COL applicant that references the U.S.EPR design certification will provide a table identifying the safety-related systems and components that use snubbers in their support systems, including the number of snubbers, type (hydraulic or mechanical), applicable standard, and function (shock, vibration, or dual-purpose snubber). For snubbers identified as either a dual-purpose or vibration arrester type, the COL applicant shall indicate whether the snubber or component was evaluated for fatigue strength.	3.9.6.4
3.9-13	A COL applicant that references the U.S. EPR design certification will identify the implementation milestones and applicable ASME OM Code for the preservice and inservice examination and testing programs. These programs will be consistent with the requirements in the latest edition and addenda of the OM Code incorporated by reference in 10 CFR 50.55a on the date 12 months before the date for initial fuel load.	3.9.6
3.10-1	If experience data is used to establish equipment qualification, A COL applicant that references the U.S. EPR design certification will document the qualification methodology and supporting data.	3.10.2

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3.10-2	A COL applicant that references the U.S. EPR design certification will create and maintain the SQDP file during the equipment selection and procurement phase.	3.10.4
3.10-3	A COL applicant that references the U.S. EPR design certification will identify any additional site specific components that need to be added to the equipment list in Table 3.10-1.	3.10.1.1
3.10-4	If the seismic and dynamic qualification testing is incomplete at the time of the COL application, A COL applicant that references the U.S. EPR design certification will submit an implementation program, including milestones and completion dates, for NRC review and approval prior to installation of the applicable equipment.	3.10.4
3.11-1	A COL applicant that references the U.S. EPR design certification will maintain the equipment qualification test results and qualification status file during the equipment selection, procurement phase and throughout the installed life in the plant.	3.11
3.11-2	A COL applicant that references the U.S. EPR design certification will identify additional site specific components that need to be added to the environmental qualification list in Table 3.11-1.	3.11.1.1.3
3.11-3	If the equipment qualification testing is incomplete at the time of the COL application, a COL applicant that references the U.S. EPR design certification will submit an implementation program, including milestones and completion dates, for NRC review and approval prior to installation of the applicable equipment.	3.11.3
3.12-1	A COL applicant that references the U.S. EPR design certification will perform a review of the impact of contributing mass of supports on the piping analysis following the final support design to confirm that the mass of the support is no more than 10% of the mass of the adjacent pipe span.	3.12.4.2
3.12-2	As indicated in Section 5.3 of topical report ANP-10264(NP), pipe and support stress analysis will be performed by the COL applicant that references the U.S. EPR design certification. If the COL applicant that references the U.S. EPR design certification chooses to use a piping analysis program other than those listed in Section 5.1 of the topical report, the COL applicant will implement a benchmark program using models specifically selected for the U.S. EPR.	3.12.4.3
3.13-1	A COL applicant referencing the U.S. EPR design certification will submit the inservice inspection plan for ASME Code Class 1, Class 2, and Class 3 threaded fasteners, to the NRC prior to performing the first inspection.	3.13.2
3E-1	A COL applicant that references the U.S. EPR design certification will address critical sections relevant to site-specific Seismic Category I structures.	3E
5.2-1	A COL applicant that references the U.S. EPR design certification will identify subsequent ASME Code editions or addenda that may be used and will determine the consistency of the U.S. EPR design with construction practices (including inspection and examination methods) reflected within the subsequent code editions and addenda identified in the COL application.	5.2.1.1
5.2-2	A COL applicant that references the U.S. EPR design certification will identify additional ASME code cases to be used.	5.2.1.2
5.2-3	A COL applicant that references the U.S. EPR design certification will identify the implementation milestones for the site-specific ASME Section XI preservice and inservice inspection program for the reactor coolant pressure boundary, consistent with the requirements of 10 CFR 50.55a (g). The program will identify the applicable edition and addenda of the ASME Code Section XI, and will identify additional relief requests and alternatives to Code requirements.	5.2.4
5.3-1	A COL applicant that references the U.S. EPR design certification will identify the implementation milestones for the material surveillance program.	5.3.1.6
5.3-2	A COL applicant that references the U.S. EPR design certification will provide a plant-specific pressure and temperature limits report (PTLR), consistent with an approved methodology.	5.3.2.1
5.4-1	A COL applicant that references the U.S. EPR design certification will identify the edition and addenda of ASME Section XI applicable to the site specific Steam Generator inspection program.	5.4.2.5.2.2
6.1-1	A COL applicant that references the U.S. EPR design certification will review the fabrication and welding procedures and other QA methods of ESF component vendors to verify conformance with RGs 1.44 and 1.31.	6.1.1.1

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6.1-2	If components cannot be procured with DBA-qualified coatings applied by the component manufacturer, A COL applicant that references the U.S. EPR design certification must do one of the following: procure the component as uncoated and apply a DBA-qualified coating system in accordance with 10 CFR 50 Appendix B, Criterion IX; confirm that the DBA-unqualified coating is removed and the component is recoated with DBA-qualified coatings in accordance with 10 CFR 50 Appendix B, Criterion IX; or add the quantity of DBA-unqualified coatings to a list that documents those DBA-unqualified coatings already existing within containment.	6.1.2.3.2
6.2-1	A COL applicant that references the U.S. EPR design certification will identify the implementation milestones for the CLRT program described under 10 CFR 50, Appendix J.	6.2.6
6.3-1	A COL applicant that references the U.S. EPR design certification will describe the containment cleanliness program which limits debris within containment.	6.3.2.2.2
6.4-1	A COL applicant that references the U.S. EPR design certification will identify any Seismic Category I Class IE toxic gas sensors necessary for control room operator protection.	6.4.6
6.4-2	A COL applicant that references the U.S. EPR design certification will provide written emergency planning and procedures in the event of a radiological or a hazardous chemical release within or near the plant, and will provide training of control room personnel.	6.4.3
6.4-3	A COL applicant that references the U.S. EPR design certification will evaluate the results of the toxic chemical accidents from Section 2.2.3 and address their impact on control room habitability in accordance with RG 1.78.	6.4.4
6.4-4	A COL applicant that references the U.S. EPR design certification will confirm that the radiation exposure of main control room occupants resulting from a design basis accident at a nearby unit on a multi-unit site is bounded by the radiation exposure from the postulated design basis accidents analyzed for the U.S. EPR; or confirm that the limits of GDC-19 are met.	6.4.4
6.6-1	A COL applicant that references the U.S. EPR design certification will identify the implementation milestones for the site-specific ASME Section XI preservice and inservice inspection program for the Class 2 and Class 3 components, consistent with the requirements of 10 CFR 50.55a (g). The program will identify the applicable edition and addenda of the ASME Code Section XI, and will identify additional relief requests and alternatives to Code requirements.	6.6
8.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information describing the interface between the offsite transmission system, and the nuclear unit, including switchyard interconnections.	8.1.1
8.1-2	A COL applicant that references the U.S. EPR design certification will identify site-specific loading differences that raise EDG or Class 1E battery loading, and demonstrate the electrical distribution system is adequately sized for the additional load.	8.1.3
8.2-1	A COL applicant that references the U.S. EPR design certification will provide site specific information regarding the offsite transmission system and their connections to the station switchyard.	8.2.1.1
8.2-2	A COL applicant that references the U.S. EPR design certification will provide site-specific information for the switchyard layout design.	8.2.1.2
8.2-3	A COL applicant that references the U.S. EPR design certification will provide site-specific information that identifies actions necessary to restore offsite power and use available nearby power sources when offsite power is unavailable.	8.2.2.7
8.2-4	A COL applicant that references the U.S. EPR design certification will provide a site-specific grid stability analysis.	8.2.2.4
8.2-5	A COL applicant that references the U.S. EPR design certification will provide site-specific information for the protective devices that control the switchyard breakers and other switchyard relay devices.	8.2.1.2
8.2-6	A COL applicant that references the U.S. EPR design certification will provide site-specific information for the station switchyard equipment inspection and testing plan.	8.2.2.5
8.2-7	A COL applicant that references the U.S. EPR design certification will provide site specific information regarding the communication agreements and protocols between the station and the transmission system operator, independent system operator, or reliability coordinator/authority. Additionally, the applicant will provide a description of the analysis tool used by the transmission system operator to determine, in real time, the impact that the loss or unavailability of various transmission system elements will have on the condition of the transmission system to provide post-trip voltages at the switchyard.	8.2.1.1
8.2-8	A COL applicant that references the U.S. EPR design certification will provide site-specific information regarding indication and control of switchyard components.	8.2.1.2

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8.3-1	A COL applicant that references the U.S. EPR design certification will monitor and maintain EDG reliability during plant operations to verify the selected reliability level target is being achieved as intended by RG 1.155.	8.3.1.1.5
8.4-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information that identifies any additional local power sources and transmission paths that could be made available to resupply the power plant following a LOOP.	8.4.1.3
8.4-2	A COL applicant that references the U.S. EPR design certification will address the RG 1.155 position C.3.4 related to procedures and training to cope with SBO.	8.4.2.6.4
9.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the heavy load handling program, including a commitment to procedures for heavy load lifts in the vicinity of irradiated fuel or safe shutdown equipment, and crane operator training and qualification.	9.1.5.2.5
9.1-2	A COL applicant that references the U.S. EPR design certification will demonstrate that the design satisfies the criticality analysis requirements for the new and spent fuel storage racks, and describe the results of the analyses for normal and credible abnormal conditions, including a description of the methods used, approximations and assumptions made, and handling of design tolerances and uncertainties.	9.1.1.3
9.1-3	A COL applicant that references the U.S. EPR design certification will describe the new fuel storage racks, including a description of confirmatory structural dynamic and stress analyses	9.1.2.2.1
9.1-4	A COL applicant that references the U.S. EPR design certification will describe the spent fuel storage racks, including a description of confirmatory structural dynamic and stress analyses and thermal-hydraulic cooling analyses.	9.1.2.2.2
9.2-1	A COL applicant that references the U.S. EPR design certification will provide site specific information for the UHS make up.	9.2.5.2
9.2-2	A COL applicant that references the U.S. EPR design certification will provide site-specific details related to the sources and treatment of makeup to the potable and sanitary water system along with a simplified piping and instrument diagram.	9.2.4.2.1
9.2-3	The raw water supply system (RWSS) and the design requirements of the RWSS are site specific and will be addressed by the COL applicant.	9.2.9
9.5-1	A COL applicant referencing the U.S. EPR certified design will identify additional site specific communication locations necessary to support effective communication between plant personnel in all vital areas of the plant during normal operation, as well as during accident conditions.	9.5.2.3
9.5-2	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.7.1, Design and Procurement Document Control.	Table 9.5-1, C.1.7.1
9.5-3	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.7.2, Instructions, Procedures and Drawings.	Table 9.5-1, C.1.7.2
9.5-4	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.7.3, Control of Purchased Material, Equipment, and Services.	Table 9.5-1, C.1.7.3
9.5-5	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.8, Fire Protection Program Changes/Code Deviations.	Table 9.5-1, C.1.8
9.5-6	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.8.1, Change Evaluations.	Table 9.5-1, C.1.8.1
9.5-7	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.8.5, 10 CFR 50.72 Notification and 10 CFR 50.73 Reporting.	Table 9.5-1, C.1.8.5
9.5-8	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.8.7, Fire Modeling.	Table 9.5-1, C.1.8.7
9.5-9	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.5.5, Post-Fire Safe- Shutdown Procedures.	Table 9.5-1, C.5.5
9.5-10	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.5.5.1, Safe- Shutdown Procedures.	Table 9.5-1, C.5.5.1

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9.5-11	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.5.5.2, Alternative/ Dedicated Shutdown Procedures.	Table 9.5-1, C.5.5.2
9.5-12	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.5.5.3, Repair Procedures.	Table 9.5-1, C.5.5.3
9.5-13	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.6.2.4, Independent Spent Fuel Storage Areas.	Table 9.5-1, Section C.6.2.4
9.5-14	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.6.2.6, Cooling Towers.	Table 9.5-1, Section C.6.2.6
9.5-15	A COL applicant that references the U.S. EPR design certification will submit site specific information to address Regulatory Guide 1.189, Regulatory Position C.7.6, Nearby Facilities.	Table 9.5-1, Section C.7.6
10.0-1	A COL applicant that references the U.S. EPR design certification will select Sections 10.1, 10.2 and 10.4.7 or 10.1A, 10.2A and 10.4.7A for inclusion in the COL FSAR as applicable to the chosen turbine-generator design option.	10.0
10.2-1	A COL applicant that references the U.S. EPR design certification will provide the site-specific turbine rotor inservice inspection program consistent with the recommendations of the manufacturer.	Not applicable. Alternate design not selected.
10.2-2	A COL applicant that references the U.S. EPR design certification will provide applicable material properties of the turbine rotor after the site specific turbine has been procured.	10.2.3.1
10.2-3	A COL applicant that references the U.S. EPR design certification will provide applicable turbine disk rotor specimen test data, load displacement data from the compact tension specimens and the fracture toughness properties after the site-specific turbine has been procured.	10.2.3.2
10.2-4	A COL applicant that references the U.S. EPR design certification, and selects the alternate turbine, will provide a list of material specifications for the alternate turbine-generator components.	Not applicable. Alternate design not selected.
10.3-1	A COL applicant that references the U.S. EPR design certification will identify the authority responsible for implementation and management of the secondary side water chemistry program.	10.3.5
10.3-2	A COL applicant that references the U.S. EPR design certification will develop a FAC condition monitoring program that is consistent with Generic Letter 89-08 and NSAC-202L-R3 for the carbon steel portions of the steam and power conversion systems that contain water or wet steam.	10.3.6.3
10.4-1	A COL applicant that references the U.S. EPR design certification will describe the site-specific main condenser materials.	10.4.1.2
10.4-2	A COL applicant that references the U.S. EPR design certification will describe the site-specific design pressure and test pressure for the main condenser.	10.4.1.2
10.4-3	A COL applicant that references the U.S. EPR design certification will provide the description of the site-specific portions of the CWS.	10.4.5.2.1
10.4-4	A COL applicant that references the U.S. EPR design certification will provide the specific chemicals used within the chemical treatment system as determined by the site-specific water conditions.	10.4.5.2.2
10.4-5	A COL applicant that references the U.S. EPR design certification will provide the site-specific CWS piping design pressure.	10.4.5.2.2
10.4-6	If a vacuum priming system is required, a COL applicant that references the U.S. EPR design certification will provide the site-specific information.	10.4.5.2.2
11.4-1	A COL applicant that references the U.S. EPR design certification will fully describe, at the functional level, elements of the Process Control Program (PCP). This program description will identify the administrative and operational controls for waste processing process parameters and surveillance requirements which demonstrate that the final waste products meet the requirements of applicable federal, state, and disposal site waste form requirements for burial at a 10 CFR Part 61 licensed low level disposal site and will be in accordance with the guidance provided in RG 1.21, NUREG-0800 Branch Technical Position 11-3, ANSI/ANS-55.1-1992, and Generic Letters 80-09, 81-38, and 81-39.	11.4.3

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11.5-1	A COL applicant that references the U.S. EPR design certification will fully describe, at the functional level, elements of the process and effluent monitoring and sampling programs required by 10 CFR Part 50 Appendix I, and 10 CFR 52.79 (a)(16). This program description, Offsite Dose Calculation Manual (ODCM), will specify how a licensee controls, monitors, and performs radiological evaluations of releases. The program will also document and report radiological effluents discharged to the environment.	11.5.2
12.1-1	A COL applicant that references the U.S. EPR design certification will fully describe, at a functional level, elements of the ALARA program for ensuring that occupational radiation exposures are ALARA. This program will comply with provisions of 10 CFR Part 20 and be consistent with the guidance in RGs 1.8, 8.2, 8.7, 8.8, 8.9, 8.10, 8.13, 8.15, 8.27, 8.28, 8.29, 8.34, 8.35, 8.36, and 8.38, and the applicable portions of NUREG-1736.	12.1.3
12.2-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information for required radiation sources containing byproduct, source, and special nuclear material that may warrant shielding design considerations. This site-specific information will include a listing of isotope, quantity, form, and use of all sources in this latter category that exceed 100 millicuries.	12.2.1.13
12.3-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the extent to which the guidance provided by RG 1.21, 1.97, 8.2, 8.8, and ANSI/ HPS-N13.1-1999 is employed in sampling recording and reporting airborne releases of radioactivity.	12.3.4.5
12.3-2	A COL applicant that references the U.S. EPR design certification will provide site-specific information on estimated annual doses to construction workers in a new unit construction area as a result of radiation from onsite radiation sources from the existing operating plant(s). This information will include bases, models, assumptions, and input parameters associated with these annual doses.	12.3.5.1
12.3-3	A COL applicant that references the U.S. EPR design certification will describe the use of portable instruments, and the associated training and procedures, to accurately determine the airborne iodine concentration within the facility where plant personnel may be present during an accident, in accordance with requirements of 10 CFR 50.34(f)(2)(xxvii) and the criteria in Item III.D.3.3 of NUREG-0737. The procedures for locating suspected high-activity areas will be described.	12.3.4.5
12.5-1	A COL applicant that references the U.S. EPR design certification will fully describe, at the functional level, elements of the Radiation Protection Program. The purpose of the Radiation Protection Program is to maintain occupational and public doses ALARA. The program description will identify how the program is developed, documented, and implemented through plant procedures that address quality requirements commensurate with the scope and extent of licensed activities. This program will comply with the provisions of 10 CFR Parts 19, 20, 50, 52, and 72 and be consistent with the guidance in RGs 1.8, 8.2, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.19, 8.15, 8.20, 8.26, 8.27, 8.28, 8.29, 8.32, 8.35, 8.36, 8.38, and the consolidated guidance in NUREG-1736.	12.5
13.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information for management, technical support, and operating organizations.	13.1
13.2-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information for training programs for plant personnel.	13.2
13.3-1	A COL applicant that references the U.S. EPR design certification will provide a site-specific emergency plan in accordance with 10 CFR 50.47 and 10 CFR 50 Appendix E.	13.3
13.4-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information for operational programs and schedule for implementation.	13.4
13.5-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information for administrative, operating, emergency, maintenance, and other operating procedures.	13.5
13.6-1	A COL applicant that references the U.S. EPR design certification will provide a site-specific security assessment that addresses identification of vital equipment, development of target sets, vulnerability assessments, defensive analyses, design features to enhance security, the portions of the NRC orders to the current operating plants that impact U.S. EPR design, and the other security features of the U.S. EPR that establish the security system design.	13.6
13.6-2	A COL applicant that references the U.S. EPR design certification will provide a PSP to the NRC to fulfill the requirements of 10 CFR 52.79(a)(35).	13.6
13.7-1	A COL applicant that references the U.S. EPR design certification will submit a physical security plan to the NRC to fulfill the fitness for duty requirements of 10 CFR Part 26.	13.7
14.2-1	A COL applicant that references the U.S. EPR certified design will provide site specific information that describes the organizational units that manage, supervise, or execute any phase of the test program.	14.2.2

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Table 1.8-2—{FSAR Sections that Address COL Items}

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14.2-2	A COL applicant that references the U.S. EPR certified design will develop a test program that considers the following five guidance components: 1. The applicant should allow at least 9 months to conduct preoperational testing. 2. The applicant should allow at least 3 months to conduct startup testing, including fuel loading, low power tests, and power ascension tests. 3. Overlapping test program schedules (for multi-unit sites) should not result in significant divisions of responsibilities or dilutions of the staff provided to implement the test program. 4. The sequential schedule for individual startup tests should establish, insofar as practicable, that test requirements should be completed prior to exceeding 25% power for SSCs that are relied upon to prevent, limit, or mitigate the consequences of postulated accidents. 5. Approved test procedures should be in a form suitable for review by regulatory inspectors at least 60 days prior to their intended use or at least 60 days prior to fuel loading for fuel loading and startup test procedures.	14.2.11
14.2-3	A COL applicant that references the US EPR design certification will provide site-specific information for review and approval of test procedures.	14.2.3
14.2-4	A COL applicant that references the US EPR design certification will address the site-specific administrative procedures for review and approval of test results.	14.2.5
14.2-5	A COL applicant that references the U.S. EPR design certification will provide site-specific test information for the circulating water supply system.	14.2.12
14.2-6	The first COL applicant that references the U.S. EPR certified design will commit to review results from European predecessors concerning the new, unique, or novel EPR features (such as reactor internals (vibration measurement), natural circulation of the reactor coolant system, reactor coolant pump stand-still seal, pressurizer surge line (thermal stratification)) and propose supplemental testing if necessary.	14.2.8.1
14.2-7	A COL applicant that references the U.S. EPR design certification will provide site-specific test information for the cooling tower.	14.2.12
14.3-1	A COL applicant that references the U.S. EPR design certification will provide ITAAC for emergency planning, physical security, and site specific portions of the facility that are not included in the Tier 1 ITAAC associated with the certified design (10 CFR 52.80(a)).	14.3
14.3-2	A COL applicant that references the U.S. EPR design certification will describe the selection methodology for site-specific SSCs to be included in ITAAC, if the selection methodology is different from the methodology described within the FSAR, and will also provide the selection methodology associated with emergency planning and physical security hardware.	14.3
16.0-1	Brackets are used to identify information or parameters that are plant specific or are based on preliminary design information. A COL applicant that references the U.S. EPR design certification will replace preliminary information provided in brackets of the Technical Specifications and Technical Specification Bases with plant specific values.	16.0
17.2-1	A COL applicant that references the U.S. EPR design certification will provide the Quality Assurance Programs associated with the construction and operations phases.	17.2
17.4-1	A COL applicant that references the U.S. EPR design certification will identify the site-specific SSCs within the scope of the RAP.	17.4.2
17.4-2	A COL applicant that references the U.S. EPR design certification will provide the information requested in Regulatory Guide 1.206, Section C.I.17.4.4.	17.4.4
17.6-1	A COL applicant that references the U.S. EPR design certification will describe the process for determining which plant structures, systems, and components (SSC) will be included in the scope of the Maintenance Rule Program in accordance with 10 CFR 50.65(b). The program description will identify that additional SSC functions may be added to or subtracted from the Maintenance Rule scope prior to fuel load, when additional information is developed (e.g., emergency operating procedures, or EOP), and after the license is issued.	17.6.1
17.6-2	A COL applicant that references the U.S. EPR design certification will provide the process for determining which SSC within the scope of the Maintenance Rule program will be tracked to demonstrate effective control of their performance or condition in accordance with 10 CFR 50.65(a)(2).	17.6.2
17.6-3	A COL applicant that references the U.S. EPR design certification will provide a program description for monitoring SSC in accordance with 10 CFR 50.65(a)(1).	17.6.2
17.6-4	A COL applicant that references the U.S. EPR design certification will identify and describe the program for periodic evaluation of the Maintenance Rule program in accordance with 10 CFR 50.65(a)(3).	17.6.3

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Table 1.8-2—{FSAR Sections that Address COL Items}

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17.6-5	A COL applicant that references the U.S. EPR design certification will describe the program for maintenance risk assessment and management in accordance with 10 CFR 50.65(a)(4). Since the removal of multiple SSC from service can lead to a loss of Maintenance Rule functions, the program description will address how removing SSC from service will be evaluated. For qualitative risk assessments, the program description will explain how the risk assessment and management program will preserve plant-specific key safety functions.	17.6.4
17.6-6	A COL applicant that references the U.S. EPR design certification will describe the program for selection, training, and qualification of personnel with Maintenance-Rule-related responsibilities consistent with the provisions of Section 13.2 as applicable. Training will be commensurate with maintenance rule responsibilities, including Maintenance Rule Program administration, the expert panel process, operations, engineering, maintenance, licensing, and plant management.	17.6.5
17.6-7	A COL applicant that references the U.S. EPR design certification will describe the relationship and interface between Maintenance Rule Program and the Reliability Assurance Program.	17.6.6
17.6-8	A COL applicant that references the U.S. EPR design certification will describe the plan or process for implementing the Maintenance Rule Program as described in the COL application, which includes establishing program elements through sequence and milestones and monitoring or tracking the performance and/or condition of SSC as they become operational. The Maintenance Rule Program will be implemented by the time that fuel load is authorized.	17.6.7
17.6-9	A COL applicant that references the U.S. EPR design certification will describe the program for Maintenance Rule implementation.	17.6
18.1-1	A COL applicant that references the U.S. EPR design certification will execute the NRC approved HFE program as described in this section	18.1
18.1-2	A COL applicant that references the U.S. EPR design certification will be responsible for HFE design implementation for a new Emergency Operations Facility (EOF) or changes resulting from the addition of the U.S. EPR to an existing EOF.	18.1.1.3
18.5-1	A COL applicant that references the U.S. EPR design will confirm that actual staffing levels and qualifications of plant personnel specified in Section 13.1 of the COL application remain bounded by regulatory requirements and results of the staffing and qualifications analysis.	18.5
18.8-1	A COL applicant that references the U.S. EPR design certification will describe how HFE principles and criteria are incorporated into the development program for site procedures.	18.8
18.9-1	A COL applicant that references the U.S. EPR design certification will describe how HFE principles and criteria are incorporated into the development of training program scope, structure, and methodology.	18.9
18.12-1	A COL applicant that references the U.S. EPR design certification will implement a human performance monitoring program similar to that which is described in this section.	18.12
19.0-1	A COL applicant that references the U.S. EPR design certification will either confirm that the PRA in the design certification bounds the site specific design information and any design changes or departures, or update the PRA to reflect the site-specific design information and any design changes or departures.	19.0
19.1-1	A COL applicant that references the U.S. EPR design certification will describe the uses of PRA in support of licensee programs and identify and describe risk-informed applications being implemented during the combined license application phase.	19.1.1.2
19.1-2	A COL applicant that references the U.S. EPR design certification will describe the uses of PRA in support of licensee programs and identify and describe risk-informed applications being implemented during the construction phase.	19.1.1.3
19.1-3	A COL applicant that references the U.S. EPR design certification will describe the uses of PRA in support of licensee programs and identify and describe any risk-informed applications being implemented during the operational phase.	19.1.1.4
19.1-4	A COL applicant that references the U.S. EPR design certification will conduct a peer review of the PRA relative to the ASME PRA Standard prior to use of the PRA to support risk-informed applications or before fuel load.	19.1.2.3
19.1-5	A COL applicant that references the U.S. EPR design certification will describe the applicant's PRA maintenance and upgrade program.	19.1.2.4.1
19.1-6	A COL applicant that references the U.S. EPR design certification will confirm that the design-specific U.S. EPR PRA-based seismic margins assessment is bounding for their specific site.	19.1.5.1.2.4
19.1-7	A COL applicant that references the U.S. EPR design certification will perform the site-specific external event screening analysis for external events applicable to their site.	19.1.5.4

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19.1-8	A COL applicant that references the U.S. EPR design certification will describe the uses of PRA in support of site-specific design programs and processes during the design phase.	19.1.1.1
19.1-9	A COL applicant that references the U.S. EPR design certification will review as-designed and as-built information and conduct walk-downs as necessary to confirm that the assumptions used in the PRA (including PRA inputs to RAP and SAMDA) remain valid with respect to internal events, internal flood and fire events (routings and locations of pipe, cable and conduit), and HRA analyses (development of operating procedures, emergency operating procedures and severe accident management guidelines and training), external events including PRA-based seismic margins HCLPF fragilities, and LPSD procedures.	19.1.2.2

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1.9 CONFORMANCE WITH REGULATORY CRITERIA

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 1.9:

> A COL applicant that references the U.S. EPR design certification will review and address the conformance with regulatory criteria in effect six months before the docket date of the COL application for the site-specific portions and operational aspects of the facility design.

This COL Item is addressed as follows:

A guide to U.S. EPR conformance with regulatory criteria is presented in Section 1.9 of the U.S. EPR FSAR. Conformance with regulatory criteria was summarized in Sections 1.9.1 through 1.9.5 of the U.S. EPR FSAR, including four conformance demonstration tables. These four conformance demonstration tables include U.S. EPR FSAR Table 1.9–2, U.S. EPR Conformance with Regulatory Guides, U.S. EPR FSAR Table 1.9–3, U.S. EPR Conformance with TMI Requirements (10 CFR 50.34(f)) and Generic Issues (NUREG-0933), U.S. EPR FSAR Table 1.9–4, U.S. EPR Conformance with Advanced and Evolutionary Light-Water Reactor Design Issues (SECY-93-087), Table 1–2, U.S. EPR Conformance with Standard Review Plan (NUREG-0800) from ANP-10292, and U.S. EPR Conformance with Standard Review Plan (NUREG-0800) Technical Report (ANP 2007).

Codes used to indicate conformance determinations in the "U.S. EPR Assessment" columns of the four conformance demonstration tables are listed in Table 1.9-1 of the U.S. EPR FSAR. The definition of the conformance code "N/A-COL" is:

> Guidance addresses concerns not addressed with the context of a design certification application and must be addressed by a combined license (COL) applicant referencing the U.S. EPR design certification.

Site-specific conformance to relevant aspects of the associated NRC guidance, as stipulated within the specific context of the cited guidance statement, was assessed for the regulatory guidance assigned a code of "N/A-COL" in the four conformance demonstration tables of the U.S. EPR FSAR.

Regulatory guidance not applicable to {Callaway Plant Unit 2} or not within the scope of the FSAR is not identified as non-conforming. Therefore, exceptions to this non-applicable regulatory guidance are not required. For example, Regulatory Guide 1.81, Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants, is not applicable to {Callaway Plant Unit 2} since it does not share emergency or shutdown electric systems with {Callaway Plant Unit 1}. The results of these assessments are presented in Sections 1.9.1, 1.9.2, 1.9.3, and 1.9.5. Conformance with regulatory criteria associated with operational experience (generic communications) is addressed in Section 1.9.4.

1.9.1 CONFORMANCE WITH REGULATORY GUIDES

Site-specific assessment of conformance with the regulatory guidance identified with a code of "N/A-COL" in Table 1.9-2 of the U.S. EPR FSAR was performed. Those regulatory guidance for which the facility takes exception are identified in Table 1.9-1. The document and section that address the exceptions are also provided in Table 1.9-1. No exceptions are taken to other applicable Regulatory Guides included in U.S. EPR FSAR Table 1.9-2.

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1.9.2 CONFORMANCE WITH THE STANDARD REVIEW PLAN

Site-specific assessment of conformance with regulatory guidance identified with a code of "N/A-COL" in Table 1-2 of ANP-10292 (AREVA, 2007) was performed. No exceptions are taken to the applicable NUREG-0800 acceptance criteria included in ANP-10292, Table 1-2.

1.9.3 GENERIC ISSUES

Assessment of the conformance with regulatory requirements and guidance identified with a code of N/A-COL in Table 1.9-3 of the U.S. EPR FSAR was performed. {Callaway Plant Unit 2} conforms to the regulatory requirements and applicable regulatory guidance in effect six months prior to the submittal date of the COL application that were assigned an assessment code of "N/A-COL" in Table 1.9-3 of the U.S. EPR FSAR.

1.9.4 OPERATIONAL EXPERIENCE (GENERIC COMMUNICATIONS)

Operational experience described in Bulletins and Generic Letters are incorporated by the NRC staff into updates of applicable sections of NUREG-0800. The U.S. EPR design certification application was submitted December 11, 2007 and addressed conformance with the most recent NUREG-0800 updates relative to the U.S EPR design certification application, March 2007 (for NUREG-0800 Chapters 1-18) and June 2007 (for NUREG-0800 Chapter 19). {The only generic communication related to plant design issued by the NRC since the last revision to NRC since the last revision to NUREG-0800 (March 2007) and before the last six month time period prior to COLA submittal, is Generic LEtter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (GL 2008-01).

The U.S. EPR design conforms to, among others, General Design Criteria 1 - Quality Standards and Records, 34 - Residual Heat Removal, 35 - Emergency Core Cooling, 36 - Inspection of Emergency Core Cooling System, 37 - Testing of Emergency Core Cooling System, 38 - Containment Heat Removal System. Piping design criteria provide for high point vents and local high point vents to allow filling and venting of piping systems, including those identified in GL 2008-01. Procedures for filling and venting piping systems and performance testing of the systems will be written and implemented prior to start-up of the plant. Therefore, a specific operational program has been added to Table 13.4-1 to verify the licensing, design, testing and corrective actions issues identified in GL 2008-01 have been resolved and corrective actions implemented.

Advanced and Evolutionary Light-Water Reactor Design Issues

Assessment of the conformance with regulatory guidance identified with a code of "N/A-COL" in Table 1.9-4 of the U.S. EPR FSAR was performed. {Callaway Plant Unit 2} conforms to the applicable regulatory guidelines in effect six months prior to the submittal date of the COL application that were assigned an assessment code of "N/A-COL" in Table 1.9-4 of the U.S. EPR FSAR.

1.9.5 REFERENCES

{AREVA, 2007. U.S. EPR Conformance with Standard Review Plan (NUREG-0800) Technical Report, ANP-10292, Revision 0, AREVA, December 2007.}

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Table 1.9-1—{Conformance with Regulatory Guides}

Note: {Callaway Plant Unit 2} conforms to applicable Regulatory Guides with the following exceptions:

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RG / Rev	Description	Exception Descriptions	Reference
		Division 1 Regulatory Guides	
1.8, R3	Qualification and Training of Personnel for Nuclear Power Plants	Licensed personnel are not able to meet Regulatory Guide 1.8, Rev. 3 operating plant experience requirements on Callaway Plant Unit 2. Regulatory Guide 1.8, Rev. 2, Regulatory Position C.1.b will be followed instead for a cold licensing program.	FSAR 13.1.3.1 FSAR 13.2.2 Technical Specifications 5.3.1
		Quality Control and Quality Assurance personnel will meet education and experience requirements in accordance with the approved Quality Assurance Program Description.	FSAR 13.1.3.1
		The Quality Assurance Manager will approve the use of an alternative for the formal education and experience requirements for Quality Assurance positions in accordance with the approved Quality Assurance Program Description.	FSAR 13.1.3.1
1.16, R4	Reporting of Operating Information—Appendix A Technical Specifications	The annual operating report and monthly operating report are submitted in accordance with Technical Specifications. Event reporting is performed in accordance with 10 CFR 50.72 and 50.73 utilizing the guidance of NUREG-1022. Technical Specifications reporting requirements are implemented, as required.	License Condition and Technical Specifications
1.23, R1	Meteorological Monitoring Programs for Nuclear Power Plants	The meteorological tower is not sited at the same elevation as finished plant grade. THis was done in order to assure that the meteorological tower is located on level, open terrain at a distance at least 10 times the height of any nearby obstruction that exceeds one-half the height of the wind measurement; No specific timeframe for the frequency of inspection has been set for the tower, guy wires and anchors.	FSAR 2.3.3.2.7 and ER 6.4.2.7
1.28, R3	Quality Assurance Program Requirements	Quality Assurance Program Requirements are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.30, R0	Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment	Quality Assurance requirements for the installation, inspection, and testing of instrumentation and electric equipment are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.33, R2	Quality Assurance Program Requirements (Operation)	Quality Assurance Program Requirements for Operation are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.38, R2	Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, Handling of Items for Water-Cooled Nuclear Power Plants	Quality Assurance requirements for packaging, shipping, receiving, storage, and handling of items are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.39, R2	Housekeeping Requirements for Water-cooled Nuclear Power Plants	Quality Assurance requirements for housekeeping are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.70, R3	Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)	The format and content of the FSAR follows Regulatory Guide 1.206 and the U.S. EPR FSAR.	FSAR 1.1.6
1.94, R1	Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants	Quality Assurance Program Requirements for installation, inspection and testing of structural concrete and structural steel during the construction phase of nuclear power plants are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5
1.116, R0	Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems	Quality Assurance Program Requirements for installation, inspection, and testing of mechanical equipment and systems are in accordance with the approved Quality Assurance Program Description.	FSAR 17.5

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Table 1.9-1—{Conformance with Regulatory Guides}

Note: {Callaway Plant Unit 2} conforms to applicable Regulatory Guides with the following exceptions:

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RG / Rev	Description	Exception Descriptions	Reference
1.132, R3	Site Investigation for Foundations of Nuclear Power Plants	Vertical Deviation Measurements were not performed on every borehole deeper than 100 feet.	FSAR 2.5.4.2.1.6 and 2.5.4.2.1.8
1.138, R2	Laboratory Investigations of Soils and rocks for Engineering Analysis and Design of Nuclear Power Plants	More recent ASTM or EPA standards were used that are equivalent to the out-of-date and uncommon test procedures discussed in Regulatory Guide 1.138, R2	FSAR 2.5.4.2.1.7
1.198, R0	Procedures and Criteria for Assessing Seismic Soil Liquefaction at Nuclear Power Plant Sites	Aerial photography was not performed to plan and conduct the subsurface investigation.	FSAR 2.5.4.8.2
1.208, R0	A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion	EPRI TR-1014381 was used in lieu of EPRI Report 1013105. EPRI Report 1013105 was an update report while EPRI TR-1014381 is the final report. For the purposes of revised estimates of aleatory uncertainty in the CEUS, there is no techinical difference between the documents. The "Recommended CEUS Sigma" values and "Conclusions" of both reports are identifical.	FSAR 2.5.2.4.4
		Division 4 Regulatory Guides	
4.4, R0	Reporting Procedure for Mathematical Models Selected to Predict Heated Effluent Dispersion in Nuclear Water Bodies	NUREG-1555 Section 5.3.2 was utilized.	ER 5.3.2
		Division 5 Regulatory Guides	
		None	
		Division 8 Regulatory Guides	
8.2, R0	Guide for Administrative Practices in Radiation Monitoring	The reference to 10 CFR 20.401 is no longer valid in the current version of 10 CFR Part 20 ANSI N13.2-1969 was reaffirmed in 1988.	FSAR 12.5
8.4, R0	Direct-Reading and Indirect-Reading Pocket Dosimeters	The reference to 10 CFR 20.202 (a) and 20.401 is no longer valid in the current version of 10 CFR Part 20. ANSI N13.5-1972 was reaffirmed in 1989. The two performance criteria specified in Regulatory Guide 8.4 (accuracy and leakage) for these devices are met using acceptance standards in ANSI N322-1997 "American National Standard Inspection, Test, Construction, and Performance Requirements for Direct Reading Electrostatic/ Electroscope Type Dosimeters."	FSAR 12.5
8.6, R0	Standard Test Procedure for Geiger-Muller Counters	The instrument calibration program is based upon criteria in ANSI N323-1978 (R1993) "Radiation Protection Instrumentation and Calibration."	FSAR 12.5
8.8, R3	Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Reasonably Achievable	Section C.3.b – Regulatory Guide 1.16 Section C.1.b (3) data is no longer reported. Reporting is also no longer required for Section C.1.b (2). Sections C.4.b – C.4.d – Conformance is with the latest revision of NUREG-0041.	FSAR 12.5

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