2.3 COL License Information

2.3.1 Envelope of Standard Plant Design Parameters

2.3.1.1 Non-Seismic Design Parameters

The following site-specific supplement addresses COL License Information Item 2.1.

Subsection 2.2.1 provides a discussion of analyses performed to demonstrate that the overall set of STP site characteristics do not exceed the capability of the reference ABWR design for the design bases events.

2.3.1.2 Seismic Design Parameters

The following site-specific supplement addresses COL License Information Item 2.2.

The information demonstrating that the STP 3 & 4 site-specific conditions meet the specified SSE ground motion is discussed in Subsection 2.5S.2, and the information demonstrating that the STP 3 & 4 site-specific conditions meet the specified bearing capacity is discussed in Subsection 2.5S.4.

2.3.2 Standard Review Plan Site Characteristics

The differences from Standard Review Plan (SRP) Section II Acceptance Criteria for the STP site-specific characteristics are provided in Table 2.1-1. Where such differences exist, the table provides supplementary information as to whether the SRP limits specified for the reference ABWR design are met for the STP 3 & 4 site, and a roadmap to the FSAR sections where further discussion of the site characteristic is provided. In addition, the STP site-specific characteristics are addressed in the FSAR sections identified in the following subsections.

2.3.2.1 Site Location and Description

The following site-specific supplement addresses COL License Information Item 2.3.

Site-specific information related to the STP 3 & 4 site location, including political subdivisions, natural and man-made features, population, highways, railways, waterways, and other significant features of the area is provided in Subsection 2.1S.1.

2.3.2.2 Exclusion Area Authority and Control

The following site-specific supplement addresses COL License Information Item 2.4.

The site-specific information related to activities that may be permitted within the designated exclusion area for STP 3 & 4 is provided in Subsection 2.1S.2.

2.3.2.3 Population Distribution

The following site-specific supplement addresses COL License Information Item 2.5.

The population data for the STP site environs is provided in Subsection 2.1S.3.

2.3.2.4 Identification of Potential Hazards in Site Vicinity

The following site-specific supplement addresses COL License Information Item 2.6.

Information with respect to industrial, military, and transportation facilities and routes to establish the presence and magnitude of potential external hazards at the STP site is provided in Subsections 2.2S.1 and 2.2S.2.

2.3.2.5 Evaluation of Potential Accidents

The following site-specific supplement addresses COL License Information Item 2.7.

The potential accident situations in the vicinity of the STP site and the bases for which these potential accidents are accommodated in the design are provided in Subsection 2.2S.3.

2.3.2.6 External Impact Hazards

The following site-specific supplemental information addresses COL License Information Item 2.8.

A review and evaluation of the effects on the protection criteria of external impact hazards at the STP site, such as general aviation or nearby explosions, is provided in Subsection 2.2S.3.

2.3.2.7 Local Meteorology

The following site-specific supplement addresses COL License Information Item 2.9.

A description of the local meteorology for the STP site is provided in Subsection 2.3S.2.

2.3.2.8 Onsite Meteorological Measurements Program

The following site-specific supplement addresses COL License Information Item 2.10.

A description of the onsite meteorological measurements program for STP 3 & 4 is provided in Subsection 2.3S.3.

2.3.2.9 Short-Term Dispersion Estimates for Accidental Atmospheric Releases

The following site-specific supplement addresses COL License Information Item 2.11.

The STP 3 & 4 site-specific short-term dispersion estimates are provided in Subsection 2.3S.4. This information is used to ensure that the envelope values provided in Tables 15.6-3, 15.6-7, 15.6-13, 15.6-14 and 15.6-18 of relative concentrations are not exceeded for the STP site.

2.3.2.10 Long-Term Diffusion Estimates

The following site-specific supplement addresses COL License Information Item 2.12.

The annual average atmospheric dispersion values for reactive releases are provided in Subsection 2.3S.5.

2.3.2.11 Hydrologic Description

The following site-specific supplement addresses COL License Information Item 2.13.

A detailed description of all major hydrologic features on or in the vicinity of the STP site is provided in Subsection 2.4S.1. A specific description of the site and all safety-related elevations, structures, exterior accesses, equipment, and systems from the standpoint of hydrology considerations is also provided in Subsection 2.4S.1.

2.3.2.12 Floods

The following site-specific supplement addresses COL License Information Item 2.14.

Site-specific information related to historical flooding and potential flooding at the STP site, including flood history, flood design considerations, and effects of local intense precipitation, is provided in Subsection 2.4S.2.

2.3.2.13 Probable Maximum Flood on Streams and Rivers

The following site-specific supplement addresses COL License Information Item 2.15.

Site-specific information related to design-basis flooding at the STP site and the extent of flood protection required for the STP 3 & 4 safety-related structures, systems, and components (SSCs) is provided in Section 2.4S.3.

2.3.2.14 Ice Effects

The following site-specific supplement addresses COL License Information Item 2.16.

The evaluation demonstrating that safety-related facilities and the water supply for STP 3 & 4 are not affected by ice flooding or blockage is provided in Subsection 2.4S.7.

2.3.2.15 Cooling Water Channels and Reservoirs

The following site-specific supplement addresses COL License Information Item 2.17.

The basis for the hydraulic design of the main cooling reservoir (MCR) and channels used to transport and impound the cooling water supply for STP 3 & 4 is provided in Subsection 2.4S.8.

2.3.2.16 Channel Diversions

The following site-specific supplement addresses COL License Information Item 2.18.

Site-specific information related to channel diversion for the STP site is provided in Subsection 2.4S.9.

2.3.2.17 Flooding Protection Requirements

The following site-specific supplement addresses COL License Information Item 2.19.

Information related to the flooding protection requirements for the STP site is provided in Subsection 2.4S.10.

2.3.2.18 Cooling Water Supply

The following site-specific supplement addresses COL License Information Item 2.20.

The natural events that may reduce or limit the available cooling water supply and the measures taken to ensure that an adequate water supply exists to operate and shut down STP 3 & 4 are identified in Subsection 2.4S.11.

2.3.2.19 Accidental Release of Liquid Effluents in Ground and Surface Waters

The following site-specific supplement addresses COL License Information Item 2.21.

The ability of the surface water environment at the STP site to disperse, dilute, or concentrate accidental releases is discussed in Subsection 2.4S.13. The effects of these releases on existing and known future uses of surface water resources are discussed in Subsections 2.4S.12 and 2.4S.13.

2.3.2.20 Technical Specifications and Emergency Operation Requirement

The following site-specific supplement addresses COL License Information Item 2.22.

Flood protection measures for the STP 3 & 4 safety-related facilities, and provisions used to ensure that an adequate water supply is available to shut down and cool the reactor, are described in Subsection 2.4S.14. The need for technical specifications and/or emergency procedures to ensure these measures is also discussed in Subsection 2.4S.14.

2.3.2.21 Basic Geological and Seismic Information

The following site-specific supplement addresses COL License Information Item 2.23.

Site-specific information related to regional and site physiography, geomorphology, stratigraphy, lithology, and tectonics for the STP site is provided in Subsection 2.5S.1.

2.3.2.22 Vibratory Ground Motion

The following site-specific supplement addresses COL License Information Item 2.24.

The STP 3 & 4 site-specific geological, seismological, and geotechnical data, including a comparison of the site-specific SSE (ground motion response spectra) to the design ground spectra (certified seismic design response spectra) in Subsection 2.3.1.2, are discussed in Subsection 2.5S.2.

2.3.2.23 Surface Faulting

The following site-specific supplement addresses COL License Information Item 2.25.

The site-specific geological data used to evaluate surface faulting at STP 3 & 4 is provided in Subsection 2.5S.3.

2.3.2.24 Stability of Subsurface Material and Foundation

The following site-specific supplement addresses COL License Information Item 2.26.

Information concerning the properties and stability of site-specific soils and rocks under both static and dynamic conditions including the vibratory ground motions associated with the STP site-specific SSE is provided in Subsections 2.5S.2 and 2.5S.4.

2.3.2.25 Site and Facilities

The following site-specific supplement addresses COL License Information Item 2.27.

The detailed description of the STP site conditions and geologic features is provided in Subsection 2.5S.1. This description includes site topographical features and the location of various Seismic Category I structures and appurtenances (pipelines, channels, etc.) with respect to the source of normal and emergency cooling water.

2.3.2.26 Field Investigations

The following site-specific supplement addresses COL License Information Item 2.28.

A discussion of field investigations conducted at the STP site is provided in Subsection 2.5S.4, including the type, quantity, extent, and purpose of the field explorations. Subsection 2.5S.4 and associated appendices include logs of the borings and test pits and results of geophysical surveys, presented in tables and profiles. Records of field permeability tests and other special field tests are also provided.

2.3.2.27 Laboratory Investigations

The following site-specific supplement addresses COL License Information Item 2.29.

The number and type of laboratory tests conducted to assess the STP site and the location of samples taken as part of the field investigations are provided in tabular form in Subsection 2.5S.4. The results of laboratory tests on disturbed and undisturbed soil samples obtained from field investigations are also provided in Subsection 2.5S.4.

2.3.2.28 Subsurface Conditions

The following site-specific supplement addresses COL License Information Item 2.30.

Details on subsurface conditions at the STP site are provided in Subsections 2.4S.12, 2.5S.1, 2.5S.2, and 2.5S.4. The subsurface conditions were investigated and the details are provided on the engineering classifications and descriptions of the soils supporting the foundations for STP 3 & 4. The information discussed includes the history of soil deposition and erosion, past and present groundwater levels, other preloading influences, and any soil characteristics that may present a hazard to plant safety. Profiles through the Seismic Category I structures are provided that show generalized subsurface features beneath these structures.

2.3.2.29 Excavation and Backfilling for Foundation Construction

The following site-specific supplement addresses COL License Information Item 2.31.

A description of the excavation and backfilling required for construction of the STP 3 & 4 foundations is provided in Subsection 2.5S.4. The site-specific soil properties below the base of the foundations are described. This description includes the configuration, along with detailed longitudinal sections and cross-sections of other safety-related STP 3 & 4 structures, including the ultimate heat sinks (UHS) and Seismic Category I buried pipes and electrical ducts. Data concerning the extent (horizontally and vertically) of all Seismic Category I excavations, fills, and slopes are provided. The locations, elevations, and grades for excavated slopes are described and shown on plot plans and typical cross-sections. A discussion of excavating and dewatering methods, excavation depths below grade, field inspection and testing of excavations, protection of foundation excavations from deterioration during construction, and the foundation dental fill work is provided in Subsections 2.4S.12 and 2.5S.4. The sources, quantities, and static and dynamic engineering properties of borrowed materials are described.

2.3.2.30 Effect of Groundwater

The following site-specific supplement addresses COL License Information Item 2.32.

An analysis of the groundwater conditions at the STP site is provided in Subsections 2.4S.12 and 2.5S.4, including the effects of groundwater on site geotechnical properties such as total and effective unit weights, cohesion and angle of internal friction, and dynamic soil properties.

2.3.2.31 Liquefaction Potential

The following site-specific supplement addresses COL License Information Item 2.33.

The liquefaction potential for the STP site under and around all Seismic Category I structures, including Category I buried pipelines and electrical ducts, is addressed in Subsection 2.5S.4. Justification for the selection of the soil properties used in the liquefaction potential evaluation (e.g., laboratory tests, field tests, and published data), the magnitude and duration of the earthquake, and the number of cycles of earthquakes is also provided in Subsection 2.5S.4.

2.3.2.32 Response of Soil and Rock to Dynamic Loading

The following site-specific supplement addresses COL License Information Item 2.34.

The dynamic soil properties for the STP site, in terms of shear modulus and material damping as a function of shear strain, are discussed in Subsection 2.5S.4. These strain-dependent properties are used in the determination of the ground motion response spectra (site-specific SSE). Due to the depth to rock at the STP site, only soil properties are investigated for STP 3 & 4.

2.3.2.33 Minimum Soil Bearing Capacity

The following site-specific supplement addresses COL License Information Item 2.35.

Minimum static bearing capacity at the foundation level of the Reactor and Control Buildings is discussed in Subsection 2.5S.4. Bearing capacity of the foundation material for the other STP 3 & 4 safety-related facilities is also discussed in Subsection 2.5S.4.

2.3.2.34 Earth Pressures

The following site-specific supplement addresses COL License Information Item 2.36.

The site-specific evaluation of static and dynamic lateral earth pressures and hydrostatic groundwater pressures acting on the STP 3 & 4 safety-related facilities is provided in Subsection 2.5S.4.

2.3.2.35 Soil Properties for Seismic Analysis of Buried Pipes

The following site-specific supplement addresses COL License Information Item 2.37.

The soil properties used for the seismic analysis of Seismic Category I buried pipes and electrical conduits for STP 3 & 4 are provided in Subsection 2.5S.4.

2.3.2.36 Static and Dynamic Stability of Facilities

The following site-specific supplement addresses COL License Information Item 2.38.

A description of the static and dynamic stability of the STP 3 & 4 facilities is provided in Subsection 2.5S.4. This information includes a discussion of the site-specific stability evaluation performed for the safety-related facilities including foundation rebound, settlement, differential settlement, and bearing capacity. The assumptions made in the stability analyses will be confirmed by as-built data, and the FSAR will be updated in accordance with 10 CFR 50.71(e) to provide confirmation that the as-built data are bounded by the assumptions. (COM 2.3-1)

2.3.2.37 Subsurface Instrumentation

The following site-specific supplement addresses COL License Information Item 2.39.

Instrumentation used for surveillance of the performance of the foundations for STP 3 & 4 safety-related structures is described in Subsection 2.5S.4. Monitoring program specifications, developed during the detailed stage of the project, addresses issues such as the installation of a sufficient quantity of instruments in the excavation zone, monitoring and recording frequency, and evaluation of the magnitude of subgrade rebound and structure settlement during excavation, dewatering, and subsequent foundation construction.

2.3.2.38 Stability of Slopes

The following site-specific supplement addresses COL License Information Item 2.40.

Information concerning the static and dynamic stability of all soil and rock slopes at the STP site whose failure could adversely affect plant safety is provided in Subsection 2.5S.5.

2.3.2.39 Embankments and Dams

The following site-specific supplement addresses COL License Information Item 2.41.

There are no embankments or dams that impound water required for safe operation (and shutdown) of STP 3 & 4.

2.3.3 CRAC 2 Computer Code Calculations

The following site-specific supplement addresses COL License Information Item 2.42.

Subsection 2.2.2 provides information regarding compliance with acceptance criteria, data input and the analyses for determining STP site acceptability for severe accidents.