FINAL SAFETY ANALYSIS REPORT INTRODUCTION

This Final Safety Analysis Report (FSAR) is a repository of information comprising the U.S. EPR™ standard design. The FSAR also provides design-related information that is to be incorporated by reference into the U.S. EPR™ design certification rule as an appendix of 10 CFR Part 52 following NRC approval. The FSAR contains this introduction, the Tier 1 information and the Tier 2 information for the U.S. EPR™ standard design. Further sections of this introduction summarize the contents and use of the FSAR.

1.0 Tier 1 Information

Tier 1 means the portion of the design-related information contained in the U.S. EPR™ FSAR that is approved and certified by the NRC. Tier 1 information includes:

- Definitions and general provisions.
- Design descriptions.
- Inspections, tests, analyses, and acceptance criteria (ITAAC).
- Significant site parameters.
- Significant interface requirements between the U.S. EPR™ standard design and systems that are wholly or partially outside the scope of the U.S. EPR™ standard design.

The Tier 1 information also includes a table of contents, a figure legend, and an abbreviation and acronyms list.

1.0 Tier 2 Information

Tier 2 means the portion of the design-related information contained in the U.S. EPR™ FSAR that is approved but not certified by the NRC. Tier 2 information includes:

- Information required by 10 CFR 52.47.
- Supporting information on the inspections, tests, and analyses that will be performed to demonstrate that the acceptance criteria in the ITAAC have been met.
- Combined license (COL) information items which identify certain matters that shall be addressed in the site-specific portion of the FSAR by an applicant who references the U.S. EPR™ design certification rule.

Tier 2 also includes conceptual designs for those portions of the plant that are outside the scope of the U.S. EPR™ standard design, and which are designated as out-of-scope in various places in the Tier 2 information. Those portions of the U.S. EPR™ standard design for which conceptual design information is included in the Tier 2 information are identified and listed in Section 1.8 of the Tier 2 information. Conceptual design information is delineated by double brackets ([[ ]]).

Tier 2 also includes generic technical specifications.

1.0 Relationship of the Tier 1 Information to the Tier 2 Information

The design descriptions, interface requirements, and site parameters in Tier 1 are derived from Tier 2 information.

Compliance with Tier 2 is required, but generic changes to, and plant-specific departures from, Tier 2 will be governed by the U.S. EPR™ design certification rule. Compliance with Tier 2 provides a sufficient, but not the only acceptable, method for complying with Tier 1. Compliance methods differing from Tier 2 must satisfy the change process in the U.S. EPR™ design certification rule.

1.0 Tier 2* Information

*Tier 2** means the portion of the Tier 2 information, designated as such in the U.S. EPR FSAR, which is subject to the change process in Section VIII.B.6 of the U.S. EPR design certification rule. This designation expires for some Tier 2* information under Section VIII.B.6 of the U.S. EPR design certification rule.

An applicant who references the U.S. EPR design certification rule may not depart from Tier 2* information, which is designated with italicized text or brackets and an asterisk in the U.S. EPR FSAR, without NRC approval. The departure will not be considered a resolved issue, within the meaning of Section VI of the U.S. EPR design certification rule and 10 CFR 52.63(a)(5).

The U.S. EPR Tier 2* information, summarized in Table I-1 of this introduction, is designated with italicized text in the Tier 2 Information. A plant-specific change to any of this Tier 2* information shall require NRC approval prior to implementation of the change. A request for departure from Tier 2* will be treated as a request for license amendment under 10 CFR 50.90.

The requirement for prior NRC approval of plant specific changes for some Tier 2* information will expire when the plant first achieves 100% power. The U.S. EPR Tier 2* information for which the Tier 2* designation expires when the COL holder first achieves 100% power operation is indicated in Table I-1 of this introduction. After the

plant first achieves full power, these Tier 2* information reverts to Tier 2 information and is subject to the same departure provisions that apply to Tier 2 information.

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
Table 1.6-1	Maximum fuel rod average burn-up	No
4.1 Table 4.1-1 4.2 4.2.2.1 4.2.5 Table 4.3-1	Fuel rod burn-up limit	No
4.3.1.1 4.3.5	Fuel Burn-up	No
6.3.2.2.2	Latent Debris Inside Containment	No
3.8	Defines key dimensions for NI Common Basemat Structure and other Seismic Category I structures shown in Figure 3B-1	Yes
3.8	ASME 2004 III Div 2 for the RCB and the liner	Yes
3.8.1.1.3	ASME 2004 III Div 2 for CC-3810 for liner anchorage system	Yes
3.8.1.2.1	ASME 2004 III Div 2	Yes
3.8.1.2.3	ASME 2004 III Div 2 CC-2000 & CC-3000	Yes
3.8.1.3	ASME 2004 III Div 2 CC-3000 for RCB	Yes
3.8.1.3	ASME 2004 III Div 2 CC-3230-1 for construction loads	Yes
3.8.1.4	ASME 2004 III Div 2 CC-3300 for RCB	Yes
3.8.1.4.10	ASME 2004 III Div 2 CC-3600 for steel liner plate	Yes
3.8.1.5	ASME 2004 III Div 2 CC-3400 for RCB	Yes
3.8.1.6	ASME 2004 III Div 2 /ACI Standard 359, CC-2000, CC-4000, CC-5000, CC-6000 and CC-9000	Yes
3.8.1.6.1	ASME 2004 III Div 2 CC-2230 for RCB	Yes
3.8.1.6.2	ASME 2004 III Div 2, CC-4333, CC-4300, and CC	Yes
3.8.1.6.3	ASME 2004 III Div 2 CC-2400 for post-tensioning system	Yes
3.8.1.6.4	ASME 2004 III Div 2 CC-2520 for liner	Yes
3.8.1.6.5	ASME 2004 III Div 2 CC-2000 for embedments	Yes
3.8.1.7.1	ASME 2004 III Div 2 CC-6000 for the SIT	Yes
3.8.2.1.1	ASME 2004 III Div 2 /1 NE-3000 for the hatches and penetrations	Yes
3.8.2.1.2	ASME 2004 III Div 2 /1 NC for pipe and sleeves	Yes

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
3.8.2.1.3	ASME 2004 III Div 2 /1 NE for electrical penetration sleeves	Yes
3.8.2.1.4	ASME 2004 III Div 2 /1 NE for penetration sleeve	Yes
3.8.2.2.1	ASME 2004 III Div 1	Yes
3.8.2.2.2	ASME 2004 III Div 1, NE-2000 for materials, App X and X-3000 for NDE	Yes
3.8.2.2.3	NE-3000 (2004) of ASME III/1	Yes
3.8.2.4	NE-3222 for buckling strength	Yes
3.8.2.6	ASME 2004 III Div 1 NE-2000 for the non-backed steel	Yes
3.8.2.7	ASME 2004 III Div 1 NE-6000 for SIT	Yes
3.8.3.2.1	ASME 2004 III Div 1, 2004 and ASME III/2, 2004	Yes
3.8.3.4.2	ASME 2004 III Div 1 NF for supports	Yes
3.8.4.2.1	ASME 2004 III Div 2	Yes
3.8.5.1.1	ASME 2004 III Div 2	Yes
3.8.5.2	ASME 2004 III Div 2	Yes
3.8.5.3	ASME 2004 III Div 2, with clarifications	Yes
3.8.5.4.1	ASME 2004 III Div 2	Yes
Appendix 3B	Key dimensions for NI Common Basemat Structure and other Seismic Category I structures	Yes

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
3.5.3 3.5.3.2 3.5.3.3 3.8.1.2.1 3.8.1.4.10 3.8.1.5 3.8.1.6.2 3.8.2.2.1 3.8.3.2.1 3.8.3.2.3 3.8.3.3.1 3.8.3.3.2 3.8.3.4 3.8.3.4.1 3.8.3.4.2 3.8.3.4.4 3.8.3.5 3.8.3.6.1 3.8.3.6.2 3.8.3.6.3 3.8.4.2.1 3.8.4.2.3 3.8.4.3.1 3.8.4.3.2 3.8.4.4.1 3.8.4.4.3 3.8.4.4.4 3.8.4.4.5 3.8.4.5 3.8.5.1.1 3.8.5.3 3.8.5.4.1 3.8.5.5 3.8.5.6.1 3A.3.1	American Concrete Institute (ACI) 318, ACI 349, American National Standards Institute/American Institute of Steel Construction (ANSI/AISC)–690	Yes
3.9.3.3	Pump and Valve Operability in accordance with ASME QME-1-2007	Yes
3.9.6.3.1.4	Acceptance Criteria for PST and IST MOVs	Yes
3.10.2	Qualifying Equipment per ASME QME-1-2007, Appendix QR-A requirements	Yes
3.11.2.2	Environmental Qualification of Mechanical Equipment per ASME QME-1-2007, Appendix QR-B requirements	Yes
3.10.1.1	Equipment seismic qualification methods and standards	Yes

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
Table 1.6-1	Piping design acceptance criteria	Yes
3.6.2.1	ASME Class 1, 2, and 3 piping Criteria Used to Define Break and Crack Location and Configuration	Yes
3.6.2.1.1.1	ASME Code Break Locations in Containment Penetration Areas	Yes
3.6.2.1.1.2	ASME Code Break Locations in Areas other Than Containment Penetration Areas	Yes
3.6.2.1.1.3	ASME Code Leakage Crack Locations in High-Energy Piping Systems	Yes
3.6.2.1.2.1	ASME Code Leakage Crack Locations in Fluid Systems in Containment Penetration Areas	Yes
3.6.2.1.2.2	ASME Code Leakage Crack Locations in Fluid Systems in Areas other than Containment Penetration Areas	Yes
3.6.2.1.2.3	ASME Code Moderate-Energy Fluid Systems in Close Proximity to High-Energy Fluid Systems	Yes
3.6.2.1.3.1	Piping design acceptance criteria used for Circumferential Pipe Breaks	Yes
3.6.2.1.3.2	Piping design acceptance criteria used for Longitudinal Pipe Breaks	Yes
3.6.2.1.3.3	Piping design acceptance criteria used for Leakage Cracks	Yes
3.6.2.2	Guard Pipe Assembly Design Criteria	Yes
3.6.2.3	Analytical Methods to Define Forcing Functions and Response Models	Yes
3.6.2.4.1	Piping design acceptance criteria used for Jet Impingement	Yes
3.6.2.4.2	Analysis of Essential System Piping Due to a Break in Attached Piping	Yes
3.6.2.4.3	Piping design acceptance criteria used for Development of Pipe Whip Hinges	Yes
3.6.2.5.1.2	Piping design acceptance criteria used for Pipe Whip Support Design	Yes
3.6.3.4.1	Piping design acceptance criteria used for Geometry and Operating Condition	Yes
3.6.3.5.2	Piping design acceptance criteria used for Leak Rate Determination Method for Main Coolant Loop and Surge Line	Yes

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
3.6.3.5.3	Piping design acceptance criteria used for Leak Rate Determination Method for Main Steam Line	Yes
3.6.3.6.1.3	Piping design acceptance criteria used for Axial Through-Wall Crack in a Straight Pipe	Yes
3.6.3.6.2.3	Piping design acceptance criteria used for Axial Through-Wall Crack in a Straight Pipe	Yes
3.6.3.7	Piping design acceptance criteria used for Leak Detection	Yes
3.9.3.5	Piping design acceptance criteria	Yes
4.1.1	Nuclear design criteria of fuel and reactivity control system, except burn-up limit	Yes
4.3.1.2	Negative Reactivity Feedbacks (Reactivity Coefficient)	Yes
4.3.1.6	Control of Power Distribution	Yes
Table 4.3-1	Core Design Criteria	Yes
Table 1.6-1	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
7.1.1.3.2	Design criteria for Process Information and Control System	Yes
7.1.1.6.4	Service Unit Connection Design criteria	Yes
7.1.4	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
7.2.3	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
7.3.3	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
7.6.3	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
7.8.3	Instrumentation and control Technical and Topical Reports Design Criteria	Yes
18.1.6	Human factors engineering program management plan	Yes
18.2.4	Human Factors Operating Experience Review Implementation Plan	Yes
18.3.5	Functional Requirements and Functional Allocation Implementation Plan, , HFE Program Management Plan	Yes
18.4.4	Task Analysis Implementation Plan	Yes

Table I-1—Summary of Tier 2* Information

Location	Description of Tier 2* Information	Expiration at First Full Power
18.5.4	Task Analysis Implementation Plan, HFE Program Management Plan	Yes
18.6.4	Implementation Plan for the Integration of Human Reliability Analysis (HRA) with Human Factors Engineering Program	Yes
18.7.9	Human Factors Operating Experience Review Implementation Plan, Human System Interface Design Implementation Plan, Functional Requirements and Functional Allocation Implementation Plan, Human Factors V and V Plan	Yes
18.10.4	Human System Interface Design Implementation Plan, Human Factors V and V Plan	Yes
18.11.5	HFE Program Management Plan, Human factors engineering Design Implementation plan	Yes
18.12.4	HFE Program Management Plan, Human Performance Monitoring Implementation Plan	Yes