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U.S. Nuclear Regulatory Commission
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Subject: Transmittal of ESBWR DCD Tier 2 Chapters 1 and 3 Markups Related to Removal of Tier 2* Designations

The purpose of this letter is to submit markups to Chapters 1 and 3 of the ESBWR DCD, Tier 2, resolving concerns raised by the NRC staff for the appropriateness of Tier 2* designations within these chapter references. The basis for removing these Tier 2* designations is the preference to be able to use the most current revisions of these referenced documents.

Enclosure (1) provides the DCD Tier 2 markups to Chapters 1 and 3 as a result of the discussions with the NRC staff concerning changes to Tier 2* designations. Included in Enclosure (1) are the Chapter 1 markups in Table 1D-1 associated with the Tier 2* removal in Chapter 5 submitted, in Reference (1). Changes associated with this letter are enclosed within boxes on the markup pages.

If you have any questions about the information provided, please contact me.

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

*DOB
NRC*

Reference:

1. MFN 10-290 – "Transmittal of ESBWR DCD Tier 2, Chapter 5 Markup Related to Tier 2* Indication for ASME B&PV Code, Section III," dated September 29, 2010

Enclosure:

1. MFN 10-302, ESBWR DCD Tier 2 Chapters 1 and 3 Markups Related to Removal of Tier 2* Designations – DCD Markups

cc: AE Cabbage USNRC (with enclosures)
J G Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
DF Taylor GEH/Wilmington (with enclosures)

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Enclosure 1

**ESBWR DCD Tier 2 Chapters 1 and 3 Markups Related to
Removal of Tier 2* Designations**

DCD Markups

Table 1D-1
Summary of Tier 2* Information

<u>Location</u>	<u>Short Description of Tier 2* Information</u>	<u>Expiration</u>
<u>S3.8.6.2</u>	<u>Site-Specific Physical Properties and Foundation Settlement</u>	<u>First Full Power</u>
<u>Table 3.8-1</u>	<u>Key Dimensions of Concrete Containment</u>	<u>First Full Power</u>
<u>Table 3.8-2</u>	<u>Load Combinations, Load Factors and Acceptance Criteria for the Reinforced Concrete Containment</u>	<u>First Full Power</u>
<u>Table 3.8-3</u>	<u>Major Allowable Stresses in Concrete and Reinforcing Steel</u>	<u>First Full Power</u>
<u>Table 3.8-4</u>	<u>Load Combination, Load Factors and Acceptance Criteria for Steel Containment Components of the RCCV</u>	<u>First Full Power</u>
<u>Table 3.8-5</u>	<u>Welding Activities and Weld Examination Requirements for Containment Vessel</u>	<u>First Full Power</u>
<u>Table 3.8-6, Ref 13, 15, 19, 20, 21, 22, 23</u>	<u>Codes, Standards, Specifications, and Regulations Used in the Design and Construction of Seismic Category I Internal Structures of the Containment</u>	<u>First Full Power</u>
<u>Table 3.8-7</u>	<u>Load Combination, Load Factors and Acceptance Criteria for Steel Structures Inside the Containment</u>	<u>First Full Power</u>
<u>Table 3.8-8</u>	<u>Key Dimensions of RB, CB, FB, RW and FWSC</u>	<u>First Full Power</u>
<u>Table 3.8-9 Ref 1, 2, 3, 4, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 40</u>	<u>Codes, Standards, Specifications, and Regulatory Guides Used in the Design and Construction of Seismic Category I Structures</u>	<u>First Full Power</u>
<u>Table 3.8-10</u>	<u>Temperatures During Operating Conditions (RB)</u>	<u>First Full Power</u>
<u>Table 3.8-11</u>	<u>Temperatures During Operating Conditions (CB)</u>	<u>First Full Power</u>
<u>Table 3.8-12</u>	<u>Temperatures During Operating Conditions (FB)</u>	<u>First Full Power</u>
<u>Table 3.8-13</u>	<u>Key Dimensions of Foundations</u>	<u>First Full Power</u>
<u>Table 3.8-14</u>	<u>Load Combinations and Factor of Safety for Foundation Design</u>	<u>First Full Power</u>
<u>Table 3.8-15</u>	<u>Load Combinations, Load Factors and Acceptance Criteria for the Safety-Related Reinforced Concrete Structures</u>	<u>First Full Power</u>

Table 3.8-6

**Codes, Standards, Specifications, and Regulations Used in the Design and Construction of
Seismic Category I Internal Structures of the Containment**

<i>Specification Reference Number</i>	<i>Specification or Standard Designation</i>	<i>Title</i>
1	ACI 301-05	Specifications for Structural Concrete
2	ACI 347-04	Guide to Formwork for Concrete
3	ACI 305R-99	Hot Weather Concreting
4	ACI 211.1-91	Standard Practice for Selecting Proportions for Normal, Heavy Weight and Mass Concrete
5	ACI 315-99	Details and Detailing of Concrete Reinforcement
6	ACI 306.1-90	Standard Specification for Cold Weather Concreting (Reapproved 2002)
7	ACI 309R-05	Guide for the Consolidation of Concrete
8	ACI 308.1-98	Standard Specification for Curing Concrete
9	ACI 212.3R-04	Chemical Admixtures for Concrete
10	ACI 214R-02	Evaluation of Strength Test Results of Concrete
11	ACI 311.5-04	Guide for Concrete Plant Inspection and Testing of Ready-Mixed Concrete
12	ACI 304R-00	Guide for Measuring, Mixing, Transporting, and Placing Concrete
[13]	<i>ACI 349-01/349R-01</i>	<i>Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary</i>]*
14	Not Used.	
[15]	<i>ANSI/AISC N690-1994 (R2004) and S2</i>	<i>Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities and Supplement No. 2⁽¹⁾</i>]*
16	AWS D1.1/D1.1M 2004	Structural Welding Code – Steel (AWS D1.1/D1.1M) Rev. 05
17	EPRI NP-5380, 1987	NCIG-01 - Visual Weld Acceptance Criteria for Structural Welding at Nuclear Power Plants, Rev. 2, Sep. 1987.
18	ANSI/ASME NQA-1-1983	Quality Assurance Program Requirements for Nuclear Facilities, 1983 Edition with NQA-1a-1983 Addenda, (Reference Section 17.0)
[19]	<i>Regulatory Guide 1.54</i>	<i>Service Level I, II and III Protective Coatings Applied to Nuclear Power Plants, Rev. 1, July 2000.</i>]*
[20]	<i>Regulatory Guide 1.94</i>	<i>Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants, Rev. 1 and Draft 2.</i>]*
[21]	<i>Regulatory Guide 1.136</i>	<i>Design Limits, Loading Combinations, Materials, Construction, and Testing of Concrete Containments, Rev. 3, March 2007.</i>]*
[22]	<i>Regulatory Guide 1.142</i>	<i>Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments), Nov. 2001.</i>]*

{Table 3.8-6

Codes, Standards, Specifications, and Regulations Used in the Design and Construction of Seismic Category I Internal Structures of the Containment

<i>Specification Reference Number</i>	<i>Specification or Standard Designation</i>	<i>Title</i>
[23	<i>Regulatory Guide 1.199</i>	<i>Anchoring Components and Structural Supports in Concrete, November 2003.]*</i>
24	(Deleted)	
25	ASME/ANSI AG-1-2003	Code on Nuclear Air and Gas Treatment
26	AISI CF02-1	AISI Specification for the Design of Cold-Formed Steel Structural Members, AISI 2001 Edition and 2004 Supplement
27	SMACNA 1481, Third Edition, 2005	HVAC Duct Construction Standards-Metal and Flexible
28	IEEE-344-1987	Recommended Practices for Seismic Qualification of Class IE Equipment for Nuclear Power Generating Stations

Explanation of Abbreviation

- ACI American Concrete Institute
- AISC American Institute of Steel Construction
- AISI American Iron and Steel Institute
- ANSI American National Standards Institute
- ASME American Society for Mechanical Engineers
- AWS American Welding Society
- EPRI Electric Power Research Institute
- IEEE Institute of Electrical and Electronics Engineers, Inc.
- NCIG Nuclear Construction Issues Group
- SMACNA Sheet Metal and Air Conditioning Contractors' National Association

Note:

*[(1) To comply with NUREG-1503, Appendix G, NRC Position on the use of ANSI/AISC N690 (1984), for impact and impulsive loads, the ductility factors μ in Table Q1.5.8.1 are replaced with the ductility factors in Appendix A to SRP Subsection 3.5.3.]**

Text sections that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2. Prior NRC approval is required to change.

{Table 3.8-9

**Codes, Standards, Specifications, and Regulatory Guides Used in the Design and
Construction of Seismic Category I Structures**

<i>Specification Reference Number</i>	<i>Specification or Standard Designation</i>	<i>Title</i>
[1]	ACI 349-01/349R-01	Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary]*
[2]	ANSI/AISC N690-1994 (R2004) & S2	Specification for the Design, Fabrication and Erection of Steel Safety-Related Structures for Nuclear Facilities and Supplement No. 2 ⁽¹⁾]*
[3]	ASME-2004	Boiler and Pressure Vessel Code Section III, Division 2, Subsection CC]*
[4]	ASME-2004	Boiler and Pressure Vessel Code Section III, Subsection NE, Division 1, Class MC]*
5	ANSI/ASME NQA-1-1983	Quality Assurance Program Requirements for Nuclear Facilities, 1983 Edition with NQA-1a-1983 Addenda, (Reference Section 17.0)
6	AWS D1.1/D1.1M 2004	Structural Welding Code - Steel
7	AWS D1.4 -98	Structural Welding Code - Reinforcing Steel (AWS D1.1/D1.1M) Rev. 05
8	AWS D1.6-99	Structural Welding Code for Stainless Steel
9	ASCE 4-98	Seismic Analysis of Safety-Related Nuclear Structures
10	ASCE 7-02	Minimum Design Loads for Buildings and Other Structures
11	AISC 360-05	2005 AISC Specification for Structural Steel Building
12	SSPC-PA-1-00	Paint Application Specification No. 1, Shop, Field and Maintenance Painting of Steel
13	SSPC-PA-2-04	Paint Application Specification No. 2, Measurement of Dry Coating Thickness with Magnetic Gages
14	SSPC-SP-1-82	Surface Preparation Specification No. 1, Solvent Cleaning
15	SSPC-SP-5-00	Surface Preparation Specification No. 5, White Metal Blast Cleaning
16	SSPC-SP-6-00	Surface Preparation Specification No. 6, Commercial Blast Cleaning
17	SSPC-SP-10-00	Surface Preparation Specification No. 10, Near-White Blast Cleaning
18	ASME 2004	Boiler and Pressure Vessel Code Section II
19	Not Used	
[20]	Regulatory Guide 1.28	Quality Assurance Program Requirements (Design and Construction), Aug. 1985]*
[21]	Regulatory Guide 1.29	Seismic Design Classification, Sep. 1978]*
[22]	Regulatory Guide 1.31	Control of Ferrite Content in Stainless Steel Weld Metal, Apr. 1978]*
[23]	Regulatory Guide 1.44	Control of the Use of Sensitized Stainless Steel, May 1973]*
[24]	Regulatory Guide 1.54	Service Level I, II and III Protective Coatings Applied to Nuclear Power Plants, Rev. 1, July 2000]*
[25]	Regulatory Guide 1.60	Design Response Spectra for Seismic Design of Nuclear Power Plants, Dec. 1973]*
[26]	Regulatory Guide 1.61	Damping Values for Seismic Design of Nuclear Power Plants, Rev. 1]*
[27]	Regulatory Guide 1.69	Concrete Radiation-Shields for Nuclear Power Plants, Dec. 1973]*
[28]	Regulatory Guide 1.76	Design Basis Tornado for Nuclear Power Plants, Apr. 1974]*
[29]	Regulatory Guide 1.94	Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants,

{Table 3.8-9

Codes, Standards, Specifications, and Regulatory Guides Used in the Design and Construction of Seismic Category I Structures

Specification Reference Number	Specification or Standard Designation	Title
		Rev. 1]*
[30	Regulatory Guide 1.136	Design Limits, Loading Combinations, Materials, Construction, and Testing of Concrete Containments, Rev. 3, March 2007.]*
[31	Regulatory Guide 1.142	Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments), Nov. 2001]*
[32	Regulatory Guide 1.143	Design Guidance for Radioactive Waste Management Systems, Structures and Components installed in Light Water Cooled Nuclear Power Plants, Nov. 2001 ⁽²⁾]*
[33	Regulatory Guide 1.199	Anchoring Components and Structural Supports in Concrete, November 2003.]*
34	(Applicable ASTM Specifications for Materials and Standards)	
35	(Deleted)	
36	ASME/ANSI AG-1-2003	Code on Nuclear Air and Gas Treatment
37	AISI CF02-1	AISI Specification for the Design of Cold-Formed Steel Structural Members, AISI 2001 Edition and 2004 Supplement
38	SMACNA 1481, Third Edition, 2005	HVAC Duct Construction Standards-Metal and Flexible
39	IEEE-344-1987	Recommended Practices for Seismic Qualification of Class IE Equipment for Nuclear Power Generating Stations
[40	Regulatory Guide 1.57	Design Limits and Loading Combinations for Metal Primary Reactor Containment System Components, March 2007.]*

Explanation of Abbreviation

ACI	American Concrete Institute	AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute	ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers	ASME	American Society for Mechanical Engineer
AWS	American Welding Society	IEEE	Institute of Electrical and Electronics Engineers, Inc.
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association		
SSPC	Steel Structures Painting Council		

See Subsections 3.8.1.2 and 3.8.3.2 for Applications.

Notes:

⁽¹⁾ To comply with NUREG-1503, Appendix G, NRC Position on the use of ANSI/AISC N690 (1984), for impact and impulsive loads, the ductility factors μ in Table Q1.5.8.1 are replaced with the ductility factors in Appendix A to SRP Subsection 3.5.3.

⁽²⁾ The seismic design of the Radwaste Building is full SSE instead of 1/2 SSE as shown in Table 2 of RG 1.143. The tornado wind loads follow Table 2.0-1 of the DCD Tier 2. Classification RW-IIa SSCs housed within the building are designed to 1/2 SSE.]*

Text sections that are bracketed and italicized with an asterisk following the brackets are designated as Tier 2. Prior NRC approval is required to change.