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Subject: **Transmittal of Changes to ESBWR DCD Tier 2, Chapter 2,
Appendix 2A**

The purpose of this letter is to submit markups identifying changes to ESBWR DCD Tier 2, Chapter 2, Appendix 2A. These changes are the result of recent interactions to address NRC staff concerns related to inconsistencies between Table 2A-3 and Table 2B-1. The changes made to Table 2A-3 resolve these inconsistencies. A change was also made to the legend of Figure 2A-1 to address a comment made by the GEH verifier.

The specific changes are shown on the markups provided in Enclosure 1. The changes identified on these markups will be incorporated into ESBWR DCD Revision 8.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Richard E. Kingston".

Richard E. Kingston
Vice President, ESBWR Licensing

Enclosure:

1. ESBWR DCD Tier 2, Chapter 2, Appendix 2A - DCD Markups

cc: AE Cabbage USNRC (with enclosure)
JG Head GEH (with enclosure)
DH Hinds GEH (with enclosure)
SR Andersen GEH (with enclosure)
eDRFSection 0000-0099-3742 Rev 0

Enclosure 1

MFN 10-193

ESBWR DCD Tier 2, Chapter 2, Appendix 2A

DCD Markups

Table 2A-3
ARCON96 Design Inputs Used for the Determination of On-Site X/Q Values

Source/Receptor	Source Type	Distance (m)	Release Height (m)	Building Area (m ²) _[2]	Intake Height (m)	Total Height (m) ^[3]	Total Width (m) ^[3]	σ_{Y0} ^[4]	σ_{Z0} ^[4]
RB to CBL	Diffuse	10	24.1 24.0	2945	2.7 2.5	48.2 48.1	49.0 ^[1]	8.17	8.03 8.01
RB to EN	Diffuse	33	24.1 24.0	2945	7.8 7.5	48.2 48.1	54.5 ^[1]	9.08	8.03 8.01
RB to ES	Diffuse	33	24.1 24.0	2945	7.8 7.5	48.2 48.1	54.5 ^[1]	9.08	8.03 8.01
RB to N	Diffuse	29	24.1 24.0	2945	7.8 7.5	48.2 48.1	59.7 ^[1]	9.95	8.03 8.01
RB to TSCB	Diffuse	131	24.1 24.0	2726	22.5 22.4	48.2 48.1	67.9 ^[1]	11.32	8.03 8.01
RB to TSCA	Diffuse	127	24.1 24.0	2726	22.5 22.4	48.2 48.1	68.5 ^[1]	11.42	8.03 8.01
PCCS to CBL	Point	38	48.2 47.8	2945	2.7 2.5	N/A	N/A	N/A	N/A
PCCS to EN	Point	54	48.2 47.8	2945	7.8 7.5	N/A	N/A	N/A	N/A
PCCS to ES	Point	63	48.2 47.8	2945	7.8 7.5	N/A	N/A	N/A	N/A
PCCS to N	Point	62	48.2 47.8	2945	7.8 7.5	N/A	N/A	N/A	N/A
PCCS to TSCB	Point	138	48.2 47.8	2726	22.5 22.4	N/A	N/A	N/A	N/A
PCCS to TSCA	Point	135	48.2 47.8	2726	22.5 22.4	N/A	N/A	N/A	N/A
TB to CBL	Diffuse	31	26.0 24.7	5513	2.7 2.5	52.0 49.4	93.2 ^[1]	15.53	8.67 8.23
TB to EN	Diffuse	29	26.0 24.7	5513	7.8 7.5	52.0 49.4	111.6 ^[1]	18.60	8.67 8.23
TB to ES	Diffuse	46	26.0 24.7	5513	7.8 7.5	52.0 49.4	108.5 ^[1]	18.08	8.67 8.23
TB to N	Diffuse	49	26.0 24.7	5513	7.8 7.5	52.0 49.4	102.9 ^[1]	17.15	8.67 8.23
TB to TSCB	Diffuse	40	26.0 24.7	3853	22.5 22.4	52.0 49.4	130.9 ^[1]	21.82	8.67 8.23

Table 2A-3

ARCON96 Design Inputs Used for the Determination of On-Site X/Q Values

Source/Receptor	Source Type	Distance (m)	Release Height (m)	Building Area (m ²) [2]	Intake Height (m)	Total Height (m) ^[3]	Total Width (m) ^[3]	σ_{Y0} ^[4]	σ_{Z0} ^[4]
TB to TSCA	Diffuse	45	26.0 24.7	3853	22.5 22.4	52.0 49.4	132.5 ^[1]	22.08	8.67 8.23
TB-TD to CBL	Point	156	3.8 3.6	7320	2.7 2.5	N/A	N/A	N/A	N/A
TB-TD to EN	Point	159	3.8 3.6	7320	7.8 7.5	N/A	N/A	N/A	N/A
TB-TD to TSCB	Point	97	3.8 3.6	7320	22.5 22.4	N/A	N/A	N/A	N/A
FB to CBL	Diffuse	28	11.5 11.4	2945	2.7 2.5	23.0 22.9	52.3 ^[1]	8.72	3.83 3.81
FB to EN	Diffuse	51	11.5 11.4	2945	7.8 7.5	23.0 22.9	49.3 ^[1]	8.22	3.83 3.81
FB to ES	Diffuse	40	11.5 11.4	2945	7.8 7.5	23.0 22.9	44.4 ^[1]	7.40	3.83 3.81
FB to N	Diffuse	34	11.5 11.4	2945	7.8 7.5	23.0 22.9	41.3 ^[1]	6.88	3.83 3.81
RW to N	Point	112	6.0 7.5	2945	7.8 7.5	N/A	N/A	N/A	N/A
RB-VS to CBL	Point	66	52.8 52.6	2945	2.7 2.5	N/A	N/A	N/A	N/A
RB-VS to ES	Point	86	52.8 52.6	2945	7.8 7.5	N/A	N/A	N/A	N/A
RB-VS to N	Point	81	52.8 52.6	2945	7.8 7.5	N/A	N/A	N/A	N/A
TB-VS to CBL	Point	122	71.3	5513	2.7 2.5	N/A	N/A	N/A	N/A
TB-VS to EN	Point	118	71.3	5513	7.8 7.5	N/A	N/A	N/A	N/A
TB-VS to N	Point	141	71.3	5513	7.8 7.5	N/A	N/A	N/A	N/A
RW-VS to CBL	Point	96	18.2	2945	2.7 2.5	N/A	N/A	N/A	N/A
RW-VS to EN	Point	111	18.2	2945	7.8 7.5	N/A	N/A	N/A	N/A
RW-VS to N	Point	120	18.2	2945	7.8 7.5	N/A	N/A	N/A	N/A

Table 2A-3

ARCON96 Design Inputs Used for the Determination of On-Site X/Q Values

Source/Receptor	Source Type	Distance (m)	Release Height (m)	Building Area (m ²) [2]	Intake Height (m)	Total Height (m) ^[3]	Total Width (m) ^[3]	σ_{Y0} ^[4]	σ_{Z0} ^[4]
BPN to CBL	Point	27	26.5	2945	2.72.5	N/A	N/A	N/A	N/A
BPN to EN	Point	40	26.5	2945	7.87.5	N/A	N/A	N/A	N/A
BPN to ES	Point	49	26.5	2945	7.87.5	N/A	N/A	N/A	N/A
BPN to N	Point	50	26.5	2945	7.87.5	N/A	N/A	N/A	N/A
BPS to CBL	Point	27	26.5	2945	2.72.5	N/A	N/A	N/A	N/A
BPS to EN	Point	49	26.5	2945	7.87.5	N/A	N/A	N/A	N/A
BPS to ES	Point	41	26.5	2945	7.87.5	N/A	N/A	N/A	N/A
BPS to N	Point	36	26.5	2945	7.87.5	N/A	N/A	N/A	N/A

Notes for Table 2A-3:

- [1] These are diffuse source widths determined in accordance with Regulatory Position 3.2.4.5 of Regulatory Guide 1.194 and are used to calculate σ_{Y0} .
- [2] The building vertical cross-sectional areas perpendicular to the wind for the building that has the largest impact on building wakes as described in the fifth item listed in Table A-2 of Regulatory Guide 1.194.
- [3] Building heights and widths are not directly used by ARCON96. They are used to calculate the lateral and vertical plume spread parameters (σ_{Y0} and σ_{Z0}).
- [4] Values calculated using Formulas 3 and 4 of RG 1.194.

The following designations are shown on Figure 2A-1.

Plant Structures

- 1 Reactor Building
- 2 Fuel Building
- 3 Control Building
- 4 Turbine Building
- 5 Electrical Building
- 6 Radwaste Building

Control Building Receptor Locations

- CBL Control Building Louvers on the west face of the Control Building (CB)
- EN Normal and Emergency Air Intakes on the east face of CB near the north end
- ES Normal and Emergency Air Intakes on the east face of CB near the south end
- N Normal Air Intake on the south face of Control Building
- TSCA Intake for Train A of the Technical Support Center HVAC on the east face of Electrical Building near the north end
- TCSB Intake for Train B of the Technical Support Center HVAC on the north face of Electrical Building near the east end

Source Locations

- RB Reactor Building¹
- TB Turbine Building¹
- FB Fuel Building¹
- PCCS Passive Containment Cooling System (Vents from the Reactor Building Roof)
- RW Radwaste Building (Assumed on the Radwaste Building Roof)
- RB-VS Reactor Building/Fuel Building Ventilation Stack
- TB-VS Turbine Building Ventilation Stack
- RW-VS Radwaste Building Ventilation Stack
- BPN Blowout panel on the northeast corner of Reactor Building
- BPS Blowout panel on the southeast corner of Reactor Building
- TB-TD Turbine Building Truck Doors on the north side of the TB near the west end

¹ There are 16 unique diffuse source/receptor pairs in Table 2A-3 all of which cannot be represented on Figure 2A-1. The planes shown in Figure 2A-1 are only graphical representations of typical ESBWR diffuse source planes.