HITACHI

GE Hitachi Nuclear Energy

Richard E. Kingston
Vice President, ESBWR Licensing

P.O. Box 780
3901 Castle Hayne Road, M/C A-65
Wilmington, NC 28402 USA

T 910.819.6192
F 910.362.6192
rick.kingston@ge.com

MFN 10-076 Supplement 1

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U.S. Nuclear Regulatory Commission
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Subject: **Transmittal of ESBWR DCD Tier 2 Chapter 6 Markups Related to Engineered Safety Systems**

The purpose of this letter is to submit markups to the ESBWR DCD, Tier 2 Chapter 6 that are being incorporated into Revision 7. The changes reflected by the markups that are boxed are corrections identified by GEH that were not incorporated into DCD Revision 6 and have not otherwise been transmitted to the NRC. The markup pages and a current change list for Chapter 6 are contained in Enclosure 1. The changes are as outlined below:

RAI	Original Response MFN	DCD Location	Description/Rationale of Change
6.2-24	06-159	Section 6.2.1.2.3	Cited Reference 6.2-11 (which is LTR NEDE-33440P Rev 2) in the text, per original RAI response.
6.2-26	06-284	Section 6.2.1.2.3	Added text verbatim per original RAI response.
6.2-55	06-215	None	No DCD change needs to be made. Because of the spillover pipe design change, the response text regarding the specific TRACG modeling of suppression pool stratification/mixing for the Feed Water Line break case is not applicable any more. The TRACG model for Feed Water Line break and Main Steam Line break containment bounding cases are similar regarding suppression pool stratification/mixing.

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RAI	Original Response MFN	DCD Location	Description/Rationale of Change
6.2-70	06-215	Section 6A Table 6.2-6	Added text from Part A of original RAI response. Added initial fluid temperature values as suggested in Part B of original RAI response. Saturated and subcooled fluid temperatures are provided for the Reactor lower plenum, and the steam dome, respectively, from TRACG steady state initialization output.
6.2-67	06-215	Section 6H, Section 6H.3	Added text per original RAI response. Original RAI response text has been updated to be consistent with DCD Rev 7.

If you have any questions or require additional information, please contact me.

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

Enclosure:

1. MFN 10-076 Supplement 1 Transmittal of ESBWR DCD Tier 2 Chapter 6 Markups Related to Engineered Safety Systems – DCD Tier 2 Chapter 6

cc: AE Cubbage USNRC (with enclosures)
JG Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
SC Moen GEH/Wilmington (with enclosures)
eDRFSection 0000-0115-3330

Enclosure 1

MFN 10-076 Supplement 1

Transmittal of ESBWR DCD Tier 2 Chapter 6

Markups Related to Engineered Safety Systems

DCD Tier 2 Chapter 6

6A. TRACG APPLICATION FOR CONTAINMENT ANALYSIS

NRC approved the application of TRACG for ESBWR containment analysis in NEDC-33083P-A (Reference 6A.1-1). Since the approval, there have been some configuration changes in the ESBWR, primarily the location of the GDCS pools in the DW space rather than being a part of the WW volume. None of these invalidate the Phenomena Identification and Ranking Table (PIRT), applicability of TRACG models or the TRACG qualification basis for containment analysis. However, the details of the application procedure have been re-evaluated for the current configuration.

The TRACG application procedure consists of the following categories of inputs:

- Nodalization;
- Phenomena for which bounding models are used;
- Model inputs – key model inputs are chosen to be conservative; and
- Plant parameter inputs – key initial conditions are chosen to be conservative.

The overall philosophy of the application procedure remains the same. The details have been re-evaluated as shown in Table 6A-1.

The volumes in various regions inside the reactor pressure vessel are calculated from the design drawings. The heat structures for the reactor internal components (such as steam dryer, chimney partitions, shroud, top guide, fuel support, core plate, and feedwater spargers) are simulated by appropriate lumped heat masses or double-sided heat slabs in the TRACG model. The vessel bottom head, top head and vertical cylindrical wall are simulated by appropriate lumped heat masses. The volumes and heat masses of steam separators, guide tubes, fuel and fuel assemblies are modeled as separate TRACG components and are based on drawings.

The volumes of other piping and systems that are external to the vessel (such as main steam lines, feedwater lines, IC system, PCCS system, and GDCS lines) are also calculated from drawings. However, the heat masses of these structures are not simulated in the DCD TRACG model.

The same DCD TRACG model is used for analyses reported in both Sections 6.2 and 6.3.

For ECCS/LOCA analyses, the focus or figure of merit is the minimum chimney static head during the first 2000 seconds following the LOCA initiation. The vessel volumes and heat masses are two of the few key parameters that would affect the short-term water inventory, and they are simulated in the TRACG model in detail.

For Containment/LOCA analyses, the focus or figure of merit is the peak drywell pressure. The limiting case is a Main Steam Line Break bounding case (Table 6.2-5). Again, the vessel internal heat masses are simulated in detail to calculate the short-term stored energy and the short-term peak drywell pressure.

The heat structures of piping and systems external to the vessel are not simulated in the DCD TRACG model. Results of parametric study (NEDC-33083P-A, Response to RAI 298) show that the heat slab in the drywell has a very small impact on the containment response. An increase of 25% vertical DW heat slab area results in a change of 0.04 psi in the long-term containment pressure.

For a specified set of power and dome pressure, the TRACG model is performed with a steady-state initialization run to assure appropriate initial conditions (such as pressures, temperatures, void fractions, flows, etc.) prior to the LOCA initiation. The reactor dome temperature corresponds to the saturation temperature at the specified dome pressure. Table 6.2-6 includes these temperatures.

6A.1 References

6A.1-1 GE Nuclear Energy, "TRACG Application for ESBWR," NEDC-33083P-A, Class III, (Proprietary), March 2005, and NEDO-33083-A, Class I (Non-proprietary), October 2005.

Table 6.2-6

Plant Initial Conditions Considered in the Containment DBA Cases

No.	Plant Parameter	Nominal Value	Bounding Value
1	RPV Core Power	100%	102%
2	WW Relative Humidity	100%	100%
3	PCCS Pool Level	4.8 m (15.8 ft)	4.8 m (15.8 ft)
4	PCCS Pool Temperature	43.3°C (110°F)	43.3°C (110°F)
5	DW Pressure	101.3 kPa (14.7 psia)	106.9 kPa (15.5 psia)
6	DW Temperature	46.1°C (115°F)	46.1°C (115°F)
7	WW Pressure	101.3 kPa (14.7 psia)	106.9 kPa (15.5 psia)
8	WW Temperature	43.3°C (110°F)	43.3°C (110°F)
9	Suppression Pool Temp.	43.3°C (110°F)	43.3°C (110°F)
10	GDCS Pool Temperature	46.1°C (115°F)	46.1°C (115°F)
11	Suppression Pool Level	5.45 m (17.9 ft)	5.50 m (18.1 ft)
12	GDCS Pool Level	6.60 m (21.7 ft)	6.60 m (21.7 ft)
13	DW Relative Humidity	20%	20%
14	RPV Pressure	7.17 MPa (1040 psia)	7.274 MPa (1055 psia)
15	RPV Water Level	NWL*	NWL*+0.3m (1 ft)
16	Maximum DW Volume	7245 m^3** (255900 ft^3)	7245 m^3** (25590 ft^3)
17	Minimum WW Volume	5300 m^3** (187200 ft^3)	5300 m^3** (187200 ft^3)
18	RPV Dome Vapor and Saturation Temperature	287.4°C (549.3°F)	288.4°C (551.0°F)
19	RPV Lower Plenum Liquid Temperature	272.3°C (522.2°F)	272.2°C (522.0°F)

*NWL = Normal Water Level (Table 15.2-1)
** Values used in Table 6.2-5a

subcompartment pressure responses were analyzed with TRACG(Reference 6.2-11). Prior to the time of peak pressure the vent flow is subsonic. The integrity of RSW is discussed in DCD Subsection 3G.1.5.4.2.3.

The break locations have been selected to maximize the mass and energy release into the subcompartment. Since instantaneous double-end guillotine breaks were postulated for all pipe breaks, Leak-Before-Break was not used to limit the break area. The mass and energy release rates are held constant for the analyses. For a feedwater line break, the critical flux is 9.389 x 10^4 kg/(s · m²), (19230 lb/(s · ft²)) from either end of the guillotine break, and the total mass release rate from both the RPV end and the reactor shield wall is 2854 kg/s, (6292 lb/s). For a RWCU line break, the critical flux is 4.868 x 10^4 kg/(s · m²), (9970 lb/(s · ft²)) from either end of the guillotine break, and the total mass release rate from both the RPV end and the reactor shield wall is 2395 kg/s, (5280 lb/s). Analyzed with TRACG, the peak subcompartment pressure responses were found to be below the design pressure for all postulated pipe break accidents.

6.2.1.3 Mass and Energy Release Analyses for Postulated Loss-of-Coolant-Accidents

Relevant to mass and energy analyses, this subsection addresses or references to other DCD locations that address the applicable requirements of GDC 50 and 10 CFR Part 50, Appendix K, paragraph I.A discussed in SRP 6.2.1.3 R1. The plant meets the requirements of:

- GDC 50, as it relates to the containment being designed with sufficient margin, requires that the containment and its associated systems can accommodate, without exceeding the design leakage rate and the containment design, the calculated pressure and temperature conditions resulting from any loss-of-coolant-accident; and
- 10 CFR 50, Appendix K, as it relates to sources of energy during the LOCA, provides requirements to assure that all the energy sources have been considered.

In meeting the requirements of GDC 50 the following criteria, which pertain to the mass and energy analyses, are used.

- Sources of Energy
  - The sources of stored and generated energy that are considered in analyses of LOCAs include reactor power, decay heat, stored energy in the core and stored energy in the reactor coolant system metal, including the reactor vessel (Table 6.2-12d, Figures 6.2-9e1, 6.2-9e2, 6.2-10e1, and 6.2-10e2) and reactor vessel internals;
  - Calculations of the energy available for release from the above sources are done in general accordance with the requirements of 10 CFR 50, Appendix K, paragraph I.A. To maximize the energy release to the containment during the blowdown and reflood phases of a LOCA, the following conservative assumptions are used in the analyses.
    - All non-wall heat structures inside the DW and WW are conservatively ignored in the analyses.
    - The DW basemat and the top DW top slab (horizontal heat slabs) are expected to see some steam condensation during the early part of the LOCA. These horizontal heat slabs are conservatively ignored in the analyses.

6H. ADDITIONAL TRACG OUTPUTS AND PARAMETRIC CASES

This appendix discusses the limiting DBA of the main steam line break base case that assumes a single failure of 1 DPV and bounding conditions and 100% double-ended guillotine break. This case is referenced as Case A in the following sections, and was documented in DCD Tier 2, Rev. 3, Subsection 6.2.1.1.3.5 and Table 6.2-6, DCD Tier 2 Rev. 3. Subsequently, additional TRACG outputs for this limiting break case, e.g., the transient air mass profiles in different regions, were generated. Also, additional parametric cases were performed to evaluate the impact of various model/plant parameters on the long-term containment pressure. This Appendix summarizes these additional TRACG outputs for the limiting break case and the results from the additional parametric studies. Section 6H.1 provides the additional TRACG outputs for the limiting DBA break case. These are the transient air mass profiles in different regions. Section 6H.2 discusses the results from the additional parametric studies, performed to evaluate the impact of various model/plant parameters on the long-term containment pressure.

Section 6H.3 discusses the impact of operation at less than 100% power on the containment conditions, with DBA conditions resulting in maximum calculated containment pressure or temperature.

6H.1 Transient Air Mass Profiles for the Limiting DBA (Main Steam Line) Break Case

This section provides the additional TRACG outputs for this limiting break case, e.g., the transient air mass profiles in different regions. Figures 6H-1 to 6H-3 show the air mass profiles in the GDCS, DW head and WW airspaces. After 20 hours into the transient, all the air mass in the GDCS and DW head airspaces is essentially purged and transferred into the WW airspace. After that time, the air mass in the WW airspace continues to increase gradually due to the generation of radiolytic gases in the core during the transient.

6H.2 Description of Parametric Cases on the Main Steam Line Break

Additional parametric cases were performed to evaluate the impact of various model/plant parameters on the long-term containment pressure. This section summarizes the additional TRACG outputs for the limiting break case and the results of the additional parametric studies.

Table 6H-1 summarizes the eight cases that are discussed and compared with the base case. The base case is the limiting DBA of the main steam line break accident (DCD Tier 2, Rev. 3, Subsection 6.2.1.1.3.5). The parametric cases (E through L) use the same nodalization and conditions as those used in the base case, except the parameters that are noted in the third column in the table.

The following paragraphs discuss the results of these parametric cases.

6H.2.1 Effect of Wetwell Stratification (Case A versus Case E)

The base Case A (with bounding conditions) assumes stratification in the top level of the WW airspace due to vacuum breaker leakage (DCD Tier 2, Rev. 3, Table 6A-1, Item 5). The parametric Case E turns off the stratification model in the WW. Figure 6H-4 compares the DW pressures from these two cases. Without the WW stratification, the calculated peak DW pressure is 10.39 kPa (1.507 psia) lower than that for the base case at 72 hours.

6H.2.2 Effect of Suppression Pool Stratification (Case A versus Case F)

The base Case A (with bounding conditions) assumes stratification in the suppression pool in the region above the highest source of mass and energy to the pool (DCD Tier 2, Rev. 3, Table 6A-1, Item 4). The parametric Case F turns off the stratification model in the suppression pool. Figure 6H-5 compares the DW pressures from these two cases. Without the suppression pool stratification, the calculated peak DW pressure is 20.79 kPa (3.015 psia) lower than that for the base case at 72 hours.

6H.2.3 Effect of IC Heat Transfer (Case A versus Case G)

The base Case A (with bounding conditions) assumes no credit for the heat transfer in the ICs (DCD Tier 2, Rev. 3, Table 6A-1, Item 19). The parametric Case G takes credit for the heat transfer in the ICs. Figure 6H-6 compares the DW pressures from these two cases. With the credit for the heat transfer in the ICs, the calculated peak DW pressure is 0.37 kPa (0.054 psia) lower than that for the base case at 72 hours.

6H.2.4 Effect of Single Failure: 1 DPV versus 1 SRV (Case A versus Case H)

The base Case A (with bounding conditions) assumes a single failure of 1 DPV. The parametric Case H assumes a single failure of 1 SRV. Figure 6H-7 compares the DW pressures from these two cases. The calculated peak DW pressure for the case with a single failure of 1 SRV is 0.79 kPa (0.11 psia) lower than that for the base case at 72 hours.

6H.2.5 Effect of Containment Outer wall Heat Transfer Area (Case A versus Cases I and J)

The parametric cases decrease the containment outer wall (in the WW airspace and suppression regions) heat transfer area by 10% (Case I) and 25% (Case J). Figures 6H-8 and 6H-9 compare the DW pressures from these cases with that from the base case. With 10% reduction in the outer wall heat transfer area, the calculated peak DW pressure at 72 hours is 1.07 kPa (0.155 psia) higher than that for the base case. With 25% reduction in the outer wall heat transfer area, the calculated peak DW pressure at 72 hours is 6.69 kPa (0.970 psia) higher than that for the base case. The increase in the calculated peak DW pressure at 72 hours is small compared to the margin to the design pressure.

6H.2.6 Effect of Containment Inner wall Heat Transfer Area (Case A versus Case K)

The parametric case increases the containment inner wall (in the vent wall between the DW and the WW) heat transfer area by 25% (Case K). Figure 6H-10 compares the DW pressures from this case with that from the base case. With 25% increase in the inner wall heat transfer area, the calculated peak DW pressure at 72 hours is 3.64 kPa (0.528 psia) lower than that for the base case. The decrease in the calculated peak DW pressure is small compared to the margin to the design pressure.

6H.2.7 Effect of Noncondensable Gases: Air versus Nitrogen (Case A versus Case L)

The base Case A (with bounding conditions) uses air properties for the noncondensable gases inside the containment (DCD Tier 2, Rev. 3, Table 6A-1, Item 15). The parametric Case L uses nitrogen properties for the noncondensable gases inside the containment. Figure 6H-11 compares the DW pressures from these two cases. The difference in the calculated peak DW pressure at 72 hours is small (~ 0.53 kPa (0.077 psia)) compared to the margin to the design pressure.

6H.2.8 Summary of Results from the Parametric Cases on the Main Steam Line Break

Eight additional parametric cases were performed to evaluate the impact of various model/plant parameters on the long-term containment pressure. Table 6H-1 describes the parameters used in these eight parametric cases. This table also summarizes the calculated peak DW pressures at 72 hours and the comparison to the base case.

Results from these parametric cases show the following:

(1) The bounding models (WW stratification and suppression pool stratification) are conservative. The calculated DW pressures are reduced by 10 to 20 kPa (1.5 to 2.9 psia) without these models, or the margins to the design pressure are improved by 3 to 6.5%.

(2) The calculated long-term DW pressure is not sensitive to the credit of IC heat transfer, the assumption of single failure (1 DPV vs. 1 SRV), or the assumption of noncondensable gas properties (air vs. nitrogen).

(3) The effect of the containment wall heat transfer areas on the calculated long-term DW pressure is small. For +/- 25% wall areas, the impact on the margin is small (-2% to +1%) compared to the base value of 9.4%.

6H.3 Effect of Operating at Less than 100% Power on the Containment Conditions

The suppression pool average temperature during normal operation is < 110 °F, and the maximum pool temperature of 110 °F is used in the safety analyses. Per Technical Specifications the reactor is required to reduce thermal power to ≤ 1% of rated thermal power when the suppression pool temperature > 110 °F, and the reactor will be switched to shutdown mode immediately when the suppression pool temperature > 120 °F.

For operation at less than 100% power, the integrated blowdown energy (the decay heat is the key contributor) from the primary system to the containment during a DBA will be smaller comparing to the case operating at 100% power.

For the feedwater line break, the maximum drywell pressure occurs at about 40 seconds during the blowdown period (Figure 6.2-9a2). Smaller integrated blowdown energy is expected to result in lower peak drywell pressure.

The long-term containment pressure depends on the wetwell partial steam pressure, which depends on the amount of blowdown energy that is discharged into the suppression pool. Figure 6.2-9c1 compares the total PCC heat removal versus the decay heat. For the first ~6 hours of the transient, the decay heat is greater than the PCC removal power. The amount that is not removed by the PCC will end up in the suppression pool and will increase the pool temperature accordingly. For operation at less than 100% power, the decay heat is lower and the equilibrium point between the decay heat and the PCC removal power will occur sooner. Consequently, there will be less heatup on the pool water, resulting in lower drywell pressure. Accordingly, it is expected that the DBA conditions will result in the maximum calculated containment pressure or temperature.

~~6H.3~~ 6H.4 References

None.

ESBWR DCD Tier 2 Chapter 6

26A6642AT Revision 6 to Revision 7 Change List

Item	Location	Description of Change
1.	Entire Chapter	Global chapter editorial changes to correct misspelling and grammar, spell out or integrate acronyms where appropriate..
2.	T6.1-1, PCCS subheading	Changed material type for PCCS tubes from "SA 213 TP 304L" to "SA 213 XM-19" in response to RAI 6.2-202 (MFN 10-044).
3.	S6.2.1.1.2, 3rd para., 5th and 6th sentences	Information added in response to RAI 9.1-128 (09-697).
4.	S6.2.1.1.2, 3rd para.	Added "which is treated as a mechanical component" and "for corrosion resistance" to 5th sentence, and added "and provides a 360° structural barrier to prevent leakage from the reactor cavity into the DW" to 6th sentence, in response to RAI 9.1-128 S01 (MFN 10-040).
5.	S6.2.1.1.2	Added section titled "Refueling Cavity Bellows Seal" in response to RAI 9.1-128 S01 (MFN 10-040).
6.	S6.2.1.1.3, 4th new para.	Added paragraph in response to RAI 6.2-64. DCD changes reflecting this change were submitted in MFN 10-003.
7.	S6.2.1.1.3, 5th new para.	Added paragraph in response to RAI 6.2-65. DCD changes reflecting this change were submitted in MFN 10-003.
8.	S 6.2.1.1.3.5.1, 1st para., 1st and 2nd sent.	Added correction for cases that are used in the post-72 hours analyses presented in the subsection. Changes were submitted in MFN 10-076.
9.	S 6.2.1.1.3.5.1, 1st para, 3rd sent.	Added "post 72 hours" in response to RAI 6.2-140 S06. DCD changes reflecting this change were submitted in MFN 09-023 Supplement 4.
10.	S 6.2.1.1.3.5.1, 3rd para & 4th para.	Deleted last sentence of 3rd paragraph and added 1st sentence of 4th paragraph. These changes supersede changes provided in response to RAI 6.2-140 in MFN 09-23 Supplement 3 by response to RAI 6.2-140 S06 in MFN 09-023 Supplement 4.
11.	S6.2.1.2.3	(MFN 10-76 Supplement 1) Cited Reference 6.2-11 (which is LTR NEDE-33440 Rev 2) in the text, per RAI 6.2-24 response (MFN 06-159).

ESBWR DCD Tier 2 Chapter 6

26A6642AT Revision 6 to Revision 7 Change List

Item	Location	Description of Change
12.	S6.2.1.2.3	(MFN 10-76 Supplement 1) Added text per RAI 6.2-26 response (MFN 06-284).
13.	S6.2.1.2.3, 2nd new para.	Added paragraph in response to RAI 6.2-13 S01. Values are replaced with those given in response to RAI 6.2-23 S02. DCD changes reflecting this change were submitted in MFN 10-003.
14.	S6.2.2, 1st para.	Added "10 CFR 50.46(b)(5), 10 CFR 52.47(a)(2)(iv), and GDC 19 of 10 CFR 50 Appendix A" in response to RAI 6.2-202 (MFN 10-044).
15.	S6.2.2, 1st para., new 4th and 5th bullets	Added in response to to RAI 6.2-202 (MFN 10-044).
16.	S6.2.2.2.2, 8th para.	Added paragraph in response to RAI 6.2-202 (MFN 10-044).
17.	S6.2.2.2.2, 9th para., 7th sent.	Revised vent fan discharge parameters in response to RAI 6.2-140 S05 (MFN 09-023 Supplement 3).
18.	S6.2.2.2.2, 9th para., last sent.	Added sentence in response to RAI 6.2-202 (MFN 10-044).
19.	S6.2.3, 4th para., 2nd sent., new 5th through 9th sent.	Added description of RB HVAC Accident Exhaust Filter unit dose consequence analysis performed in response to RAI 9.4-53 S01 Revised Response (MFN 09-627, Rev 1).
20.	6.2.3.2, 5th para.	Added new paragraph describing passively-acting relief devices that vent to the environment.
21.	S6.2.5.1, new last para.	Added paragraph in response to RAI 6.2-202 (MFN 10-044).
22.	S6.2.5.4.1, 4th paragraph	Added paragraph in response to RAI 6.2-202 (MFN 10-044).
23.	S6.2-9, Reference 6.2-10	Corrected reference to add "Vol. 1 and 2," since report has two volumes. DCD changes reflecting this reference update were submitted in MFN 10-076.
24.	S6.2.9, Reference 6.2-11	Reference for NEDE-33440P and NEDO-33440 was updated to indicate latest revision submitted in MFN 10-093. No further DCD changes were required as a result of this reference update.

ESBWR DCD Tier 2 Chapter 6

26A6642AT Revision 6 to Revision 7 Change List

Item	Location	Description of Change
25.	T6.2-6	(MFN 10-76 Supplement 1) Added temperature values per RAI 6.2-70 response Part B (MFN 06-215).
26.	T6.2-49	Added sixth row in response to RAI 6.2-140 S05 (MFN 09-023 Supplement 3). The following corrections evolved from ACRS comments. Text has been added to the existing footnote to specify the range of fluid densities associated with the pressure drop vs. flow rate values in this Table. The fluid density range is obtained for the fan from the same TRACG output that provided the values in this Table, (MFN-10-076).
27.	F6.2-7	The following corrections evolved from ACRS comments. a) The MSL (Main Steamline) break pipe location in the drywell is displayed correctly in the Figure (PIPE 311 connected to Level 34, Ring 5). b) A label is included in the Figure to indicate that the Drywell (DW) Head air space includes Rings 1 through 5. c) Labels for L23, L25, L28, L33, L34, L37, L39, and L41 that were missing from the Figure, have been included. d) An open flow area (FA) between Ring 4 and Ring 5 at Level 34, which was erroneously displayed as a solid line previously, is correctly shown as a dashed line. This open flow area allows flow from the DW Head to enter the Upper DW (without going all the way down the RPV annulus). e) The "1 GDCS Pool" label is correctly located in the GDCS pool (previously incorrectly located inside the PCC fan discharge tray). f) A footnote is added to the Figure to indicate that the connection PIPE40 to VSSL is changed to Level 41 for the post-72 hour LOCA phase. PIPE40 sets the PCCS pool overflow level, (MFN-10-076).

ESBWR DCD Tier 2 Chapter 6

26A6642AT Revision 6 to Revision 7 Change List

Item	Location	Description of Change
28.	F6.2-14e1, F6.2-14e2, F6.2-14e3, F6.2-14e4, F6.2-14e5, F6.2-14e6, F6.2-14e7, F6.2-14e8, F6.2-14e9, F6.2-14e9a, F6.2-14e10, F6.2-14e10a	Revised figures in response to RAI RAI 6.2-140 S06 (MFN 09-023 Supplement 4). The revised figures supersede changes provided in RAI 6.2-140 S05 (MFN 09-023 Supplement 3).
29.	F6.2-35	Added in response to RAI 9.1-128 S01 (MFN 10-040).
30.	S6.3.2.7.2, 2, 1st new paragraph	Added minimum slope requirements in response to RAI 6.3-89 (MFN 09-750).
31.	S6.3.2.7.4, 6th new paragraph, 7th paragraph	Added pre-operational testing requirement for GDCS squib valves in response to RAI 6.3-89 (MFN 09-750).
32.	S6.3.5, 2nd para., 1st sent.	Revised reference to reflect that IEEE 279 has been withdrawn and replaced by IEEE 603.
33.	S6.4, 6th para., new 6th sent.	Added new sentence on "variable orifice relief device" per RAI 6.4-23 (MFN 09-759).
34.	S6.4.2; 3rd para., 1st sentence	Added "variable orifice relief device" per RAI 6.4-23 (MFN 09-759).
35.	S6.4.2; 3rd para., new 3rd sent.	Added new sentence stating: *"The EFU delivered supply air is distributed in the MCR area of the CRHA"* per RAI 9.4-29 S04 (MFN 09-767).
36.	S6.4.2; new 4th paragraph	Added new paragraph defining "occupied zone" and "short cycling" per RAI 9.4-29 S04 (MFN 09-767).
37.	S6.4.3, Component Description, 1st para.,5th and 6th sent.	Added new sentences describing the "variable orifice relief device" per RAI 6.4-23 (MFN 09-759).

ESBWR DCD Tier 2 Chapter 6

26A6642AT Revision 6 to Revision 7 Change List

Item	Location	Description of Change
38.	S6.4.3, Component Description, 1st para., 3rd bullet	Added "(including variable orifice relief device)" to Isolation Dampers and Valves per RAI 6.4-23 (MFN 09-759).
39.	S6.4.3, Leak Tightness, 2nd para., 1st sent.	Added "components" to 1st sentence per RAI 6.4-23 (MFN 09-759).
40.	S6.4.3, Leak Tightness, 2nd para., 6th Item f	Added "variable orifice relief device" per RAI 6.4-23 (MFN 09-759).
41.	S6.4.4, 1st para., 1st and 2nd sentences	Added text to the first sentence and new second sentence per RAI 6.4-23 (MFN 09-759).
42.	S6.4.4, Emergency Mode, 2nd para., 5th and 6th sentences	Added new 5th and 6th sentences per RAI 6.4-23 (MFN 09-759).
43.	S6.4.4. Airflow in Emergency Mode, new 1st through 5th paras.	Added new paragraphs per RAI 9.4-29 S04 (MFN 09-767).
44.	S6.4.4, Airflow in Emergency Mode, 8th para.	Updated paragraph in response to RAI 6.4-24 S01 Part 1 (MFN 09-776 Supplement 1).
45.	S6.4.5, 4th para., 4th sent.	Added new sentence reference to Table 3H-14 per RAI 9.4-57 (MFN 09-767).
46.	S6.4.7, Testing and Inspection, 1st para., 4th and 5th sentences.	Added new 4th and 5th sentences per RAI 9.4-57 (MFN 09-767).

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Item	Location	Description of Change
47.	S6.4.7, Preoperational Inspection and Testing, 1st para., 2nd sent.	Added new sentence describing the variable orifice relief device per RAI 6.4-23 (MFN 09-759).
48.	S6.4.7, Inservice Testing, 2nd para.	Added new paragraph to Inservice Testing per RAI 6.4-22 (MFN 09-759).
49.	S6.4.7, Inservice Testing, new last paragraph	Modified new last paragraph under Inservice Testing per RAI 6.4-22 S01 (MFN 09-759 Supplement 1).
50.	S6.4.9, 6.4-1-A; Last sent.	Added "including statements under 6.4.7" to last sentence per RAI 6.4-22 (MFN 09-759).
51.	S6.4.10, Reference 6.4-5	Replaced Reference 6.4-5 in response to RAI 6.4-24 S01 (MFN 09-776 Supplement 1).
52.	F6.4-2	Added new Figure 6.4-2 per RAI 9.4-29 S04 (MFN 09-767).
53.	S6.6.7 and COL Information item 6.6-1-A	RAI 10.2-18 S03 requested a revision to document the "augment inspection" program for equipment important to turbine protection.
54.	S6A	(MFN 10-76 Supplement 1) Added text per RAI 6.2-70 response Part A (MFN 06-215).
55.	6B, Reference 6B.1-2	Reference for NEDE-32176P was updated to indicate latest revision submitted in MFN 08-072. In addition, added non-proprietary version of report to reference. DCD changes reflecting this reference update were submitted in MFN 10-076.
56.	S6E.2	Clarify the role of radiolysis versus radiation per RAI 21.6-103 S01 (MFN 09-224 Supplement 2).
57.	S6E.4	Clarify the role of radiolysis versus radiation per RAI 21.6-103 S01 (MFN 09-224 Supplement 2).
58.	S6E.5	Clarify the role of radiolysis versus radiation per RAI 21.6-103 S01 (MFN 09-224 Supplement 2).

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Item	Location	Description of Change
59.	SG, Reference 6G-2	Added non-proprietary version of report to reference. DCD changes reflecting this reference update were submitted in MFN 10-076.
60.	S6H.3	(MFN 10-76 Supplement 1) Added text per RAI 6.2-67 response (MFN 06-215).
61.	S6H.4	(MFN 10-76 Supplement 1) Renamed previous Section 6H.3 to 6H.4