RAIs - Chapters 11 and 12 - ESBWR Design Control Document

RAI Number	Full Text
11.2.3-1	The decontamination factors (DF) listed in Table 11.2-3 are not consistent with NUREG-0016. No DF value is given for tritium. See related RAI No. 12.2.2-4. Without this information, the staff cannot independently confirm the annual doses reported in Table 12.2-20.
11.2.3-2	The text does not state which sets of decontamination factors were used to assess doses from liquid releases. The text states that the values listed in Table 11.2-3 are conservative and consistent with NUREG-0016, but does not specify whether the "Total DF" values were used given that (i) the use of a second ion-exchanger in series is optional by NUREG-0016, (ii) if the use of a second ion-changer was applied in calculating doses, and (iii) whether an aggregate DF (weighted by liquid waste volume estimates from Table 11.2-4) was derived and applied in calculating doses. See related RAI No. 12.2.2-4. Without this information, the staff cannot independently confirm the annual doses reported in Table 12.2-20.
11.2.5-1	The text describing instrumentation used to monitor liquid effluent releases is inconsistent with that of Section 11.5.3.2.6. It does not refer to the use of a continuous radiation monitoring system. Update the text accordingly.
11.2.5-2	The presence of the continuous liquid effluent radiation monitor is not discussed in the text, nor shown in Figure 11.2-1. Provide an updated figure showing the placement of the liquid effluent radiation monitor.
11.5.3-1	The operational ranges of radiation monitoring systems listed in Tables 11-5.1 and 11.5-2 are inconsistently presented in terms of expected activity levels or dynamic ranges. For example, the dynamic response ranges of stack vent instrumentation of the Radwaste, Turbine, and Spent Fuel ventilation systems given in Table 11.5-1 are different than shown in Table 11.5-2. Also, the reported activity levels given in Table 11.5-2 for the Plant Stack are beyond the dynamic detection range, i.e., the expected activity levels are lower than the lowest dynamic range by 3 to 5 orders of magnitude. Confirm whether the stated dynamic range of the instrumentation is correct as indicated.
11.5.3-2	The radiological units of the Turbine Building Vent Exhaust (Normal Vent and Area Exhausts) and Turbine Building HVAC Vent monitoring systems given in Table 11-5.1 are expressed in "mSv/h" but listed as "MBq/m^3" in Table 11.5-2. Provide tables with updated information
11.5.3-3	This section refers to Table 11.5-3 and Fig. 11.5-1 for information about the designation and ID codes of radiation monitoring systems. A review of instrumentation ID codes indicates that the numbering system is inconsistent for ID No. 21, 22 and 23. The system identified as No. 21 on Fig. 11.5-1 is not listed in Table 11.5-3 and its designation ("#21, COPS") and function are not described in the Section. As a result, ID codes No. 21 and 22 presented in Table 11.5-3 are not consistent with those shown in Fig. 11.5-1. Also, instrument ID code No. 23 is missing in Table 11.5-3, but is included in Fig. 11.5-1. Provide figures and tables (and text as needed) with updated information.

RAI Number	Full Text
12.2.2-1	The evaluation of doses associated with airborne effluent releases is based on assumed atmospheric dispersion parameters given in Table 12.2-15. The text does not present any discussion about the assumptions used in developing the dispersion parameters at the stated distance of 800 m. A review of Section 2.3.5 (Long-Term Diffusion Estimates) of the Design Control Document indicates that the parameters were derived using NRC guidance (NUREG-0800 and NUREG- 0324), but no details are provided on the assumptions used. It should be noted that NUREG-0324 (Sept. 1977) has been superseded by NUREG/CR-2919 (Sept. 1982). Without this information, the staff cannot independently confirm the adequacy of the values given for the dispersion parameters and resulting annual doses reported in Table 12.2-18.
12.2.2-2	Table 12.2-16 presents anomalous radioactivity release inventories for Kr-87 and Xe-135 from the Offgas System. In both instances, the listed annual releases appear to be unrealistically low by orders of magnitude. Without a clarification, the staff cannot independently confirm the annual doses reported in Table 12.2-18.
12.2.2-3	The evaluation of doses associated with airborne effluent releases is stated as being based on the methodology presented in NUREG-0016 and NUREG/CR-4653. The text does not present any discussion of the assumptions used in describing offsite dose receptor locations, rationale for the exposure pathways listed in Table 12.2-18, and a listing of all model parameters used in calculating doses. Without this information, the staff cannot independently confirm the annual doses reported in Table 12.2-18.
12.2.2-4	The text does not state which sets of decontamination factors were used to assess doses from liquid radioactive releases. The text states that the values listed in Table 12.2-19 are bounding and consistent with NUREG-0016, but does not specify which decontamination factors (DF) listed in Table 11.2-3 were used in deriving the annual activity inventories of Table 12.2-19. A cursory check of the information presented in Table 12.2-19 indicates that a DF of 100 was used in estimating liquid effluent concentrations of I-131, Co-60, Cs-137, Ba-140, and Np-239. Also, it was noted that a DF of 100 was used for tritium, which is contrary to the DF (value of 1) prescribed in NUREG-0016. Note that the application of a DF of 1 for tritium is expected to result in liquid effluent discharge concentrations that are about twice the limit of App. B (Table 2, Col. 2) of Part 20. See related RAI No. 11.2.3-1.
12.2.2-5	The text cites the use of a liquid waste dilution factor of 10 prior to the point of release that is closest to the public, but no rationale is given for this value. The discussion does not state if a dilution factor was applied beyond the point of release in assessing doses to hypothetical receptors listed in Table 12.2-20. Provide the rationale for the dilution factor of 10 and address whether additional dilution factors were used to calculate doses to the hypothetical receptors listed in Table 12.2-20.

12.2.2-6	Table 12.2-19 presents estimated liquid effluent concentrations for comparison against the limits of App. B to Part 20. A review of the listed limits indicate that they are based on the 1993 edition of Part 20 instead of the current Part 20. It should be noted that compliance with liquid effluent limits of the current Part 20 is required. For comparison note that the effluent limits listed in Table 12.2-17 are based on the current Part 20 App. B criteria. Provide an updated version of Table 12.2-19 listing liquid effluent concentration limits based on current NRC criteria.
12.2.2-7	The listing of radionuclides in Table 12.2-19 is inconsistent with that of Table 12.2-17. Table 12.2-19 includes Co-57 but Table 12.2-17 does not. Table 12.2-19 includes Pr-143 but Table 12.2-17 lists Pr-144 instead. Provide updated versions of Tables 12.2-19 and 12.2-17.
12.2.2-8	The evaluation of doses associated with liquid effluent releases is stated as being based on the methodology presented in NUREG-0016 and NUREG/CR-4013. The text does not present any discussion of the assumptions used in describing offsite dose receptor locations, rationale for the exposure pathways listed in Table 12.2-20, and a listing of all model parameters used in calculating doses. Without this information, the staff cannot independently confirm the annual doses reported in Table 12.2-20.