GE Hitachi Nuclear Energy

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MFN 15-003 Supplement 1

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US Nuclear Regulatory Commission
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Washington, DC 20555-0001

Subject: **NRC Request for Additional Information Letter Number 2 Related to Chapters 1, 2, and 12 for GE-Hitachi Nuclear Energy Advanced Boiling Water Reactor Design Certification Rule Renewal Application – GEH Supplemental Responses to RAIs 12.02-2 and 12.02-3**

References:

1. Letter from USNRC to Jerald G. Head, GEH, Subject: Request for Additional Information Letter No. 2 Related to Chapters 1, 2, and 12 for GE-Hitachi Nuclear Energy Advanced Boiling Water Reactor Design Certification Rule Renewal Application, September 25, 2014.

2. Letter from Jerald G. Head, GEH, to USNRC, Subject: NRC Request for Additional Information Letter Number 2 Related to Chapters 1, 2, and 12 for GE-Hitachi Nuclear Energy Advanced Boiling Water Reactor Design Certification Rule Renewal Application – GEH Responses to RAIs 12.02-2 and 12.02-3, January 22, 2015.

In regard to the Requests for Additional Information transmitted in your September 25, 2014 letter, Reference 1, please find attached GEH's supplemental responses to RAIs 12.02-2 and 12.02-3.

In the public and private meeting held between the NRC and GEH on May 7th, 2015, GEH reviewed the closure plan for the "28-item backfit list" including the Requests for Additional Information (RAI) responses that GEH had submitted to date. During that meeting, the GEH responses to RAIs 12.02-2 and 12.02-3, Reference 2, were reviewed. After that review, the NRC requested that GEH provide supplemental information for the staff's review.

Please find attached the requested supplemental information to RAIs 12.02-2 and 12.02-3. Enclosure 1 contains the complete response and is supplemented by additional information that

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the NRC requested, while Enclosure 2 contains the Design Control Document markups associated with this supplemental information request.

If you have any questions concerning this letter, please contact Hugh Upton at 408-314-8499.

I declare under penalty of perjury that the foregoing information is true and correct to the best of my knowledge, information, and belief.

Sincerely,

Jerald G. Head
Senior Vice President, Regulatory Affairs

Commitments: No additional commitments are made in this response.

Enclosures:

1. GEH Response and Supplemental Response to RAIs 12.02-2 and 12.02-3
2. GEH Supplemental Response to RAIs 12.02-2 and 12.02-3 - ABWR DCD DRAFT Revision 6 Markups

cc: Adrian Muniz, NRC
David Sledzik, GEH
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Enclosure 1

MFN 15-003 Supplement 1

GEH Responses and Supplemental Responses to RAIs 12.02-2 and 12.02-3

IMPORTANT NOTICE REGARDING CONTENTS OF THIS DOCUMENT
Please Read Carefully

(Please note that below is GEH's original response to RAI 12.02-2 for convenience)

NRC Request for Additional Information 12.02-2:

10 CFR 52.59(a) requires, in pertinent part, a finding of compliance with the regulations in effect at the time of original certification in order to issue a renewed design certification. As required by the regulations in effect at the time the ABWR DC was originally issued, the ABWR DC application must contain "[t]he technical information which is required of applicants for construction permits and operating licenses by 10 CFR part 20, part 50 and its appendices, and parts 73 and 100, and which is technically relevant to the design and not site-specific." 10 CFR 52.47(a)(1)(i). In 1997, operating license FSARs were required by 10 CFR 50.34(b)(3) (1997) to include "[t]he kinds and quantities of radioactive materials expected to be produced in the operation and the means for controlling and limiting radioactive effluents and radiation exposure within the limits set forth in part 20 of this chapter."

10 CFR 20.1101(b) (1997) requires that the licensee use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to member of the public that are as low as is reasonably achievable.

The GEH ABWR DCD Section 9.2.9.2 indicates that water can be sent to the condensate storage tank (CST) from several sources that could potentially be contaminated, including the control rod drive system and the radwaste disposal system. However, the DCD does not contain any source term information for the CST nor does it describe any controls to limit effluent releases or radiation exposure from the CST during normal operations or anticipated operational occurrences, as required by 10 CFR 50.34(b)(3) and 10 CFR 20.1101(b).

Therefore, in order to ensure compliance with 10 CFR 52.59 (2014) and 10 CFR 52.47(a)(1)(i), 10 CFR 50.34(b)(3), and 10 CFR 20.1101(b) (1997):

1) Update Chapter 12 of the GEH ABWR DCD to provide source term information (including source geometry) and shielding information for the CST.

2) Update Chapters 11 and 12 of the GEH ABWR DCD, as appropriate, to describe any procedures or engineering controls used to control radioactive effluents and radiation exposure from the CST, such as provisions to prevent CST overflow or design features to contain radioactive material if a leak or overflow were to occur.

3) Update Chapters 11 and 12 of the GEH ABWR DCD, as appropriate, to describe the locations, functions, and design features of piping routed to and from the CST in order to ensure that radioactive effluents and radiation exposure is being adequately controlled. Include any design features to detect or prevent leakage from outdoor pipes in order to ensure control of effluent releases from the site.

4) Update the Chapter 12 radiation zone drawings of the GEH ABWR DCD, to include the location of the CST, including radiation zoning for the CST.

GEH Response to RAI 12.02-2:

The responses provided below address each of the questions in RAI 12.02-2:

1) Update Chapter 12 of the GEH ABWR DCD to provide source term information (including source geometry) and shielding information for the CST.

GEH agrees the absence of the requested information does not comply with 10 CFR 50.34(b)(3) and 10 CFR 20.1101(b). To ensure compliance with regulatory requirements, a combined license (COL) item will be added in Chapter 12 of the GEH ABWR DCD for the COL applicant to provide the condensate storage tank (CST) source term and shielding information. The COL item is used to maintain flexibility in the liquid waste management system design for the COL application. The COL applicant will ensure there is sufficient shielding provided for the CST to ensure a dose rate of ≤ 6 μSv/hr in the area surrounding the CST. Therefore, the area around the CST will be designated as radiation zone designation, A, "uncontrolled, unlimited access".

The COL item described in this response for ABWR DCD Chapter 12 will be added as Subsection 12.2.3.2 in the next revision of the ABWR DCD, including listing the item in Table 1.9-1, as shown in Enclosure 2. In addition, the CST will be added to Table 12.2-5a also as shown in Enclosure 2.

2) Update Chapters 11 and 12 of the GEH ABWR DCD, as appropriate, to describe any procedures or engineering controls used to control radioactive effluents and radiation exposure from the CST, such as provisions to prevent CST overflow or design features to contain radioactive material if a leak or overflow were to occur.

It should be recognized that the COL item being added to the DCD in response to Item 1 constitutes an additional engineered control which ensures the dose rate in the area surrounding the CST will not exceed the upper limit for radiation zone A; which will allow uncontrolled and unlimited access to the area around the CST. Additional procedures and engineering controls already used to control radioactive effluents and radiation exposure from the CST are stated in Chapter 11, Subsection 11.2.1.2 of the GEH ABWR DCD as follows:

Engineered Controls
"The Condensate storage tank, which is located outdoors, has liquid level monitoring with alarms in the control room. The tank overflows, drains and sample lines are routed to the radwaste system. A dike is provided around the tank to prevent runoff in the event of a tank overflow. A drain within the dike is routed to the radwaste system."

The dike prevents leaks or overflows of the CST from reaching the environment and the drain inside the dike ensures any runoff from tank leaks or overflows is processed through the radwaste system to control radioactive effluents from the CST and preclude any uncontrolled releases to the environment. The CST also has the liquid high level alarm to prevent tank overflow. The structure for the transfer pumps will be integrated in the dike, as well as the interface with the pipe chases or guard pipes. This description will be implemented in Chapter 11, Subsection 11.2.1.2 of the next revision of the GEH ABWR DCD as shown in Enclosure 2.

Procedures
In addition, as stated in Table 11.5-4 (Item 4) of the DCD, samples are taken weekly of the CST to evaluate water radioactivity and control the radioactive effluents and radiation exposure from the CST.

3) Update Chapters 11 and 12 of the GEH ABWR DCD, as appropriate, to describe the locations, functions, and design features of piping routed to and from the CST in order to ensure that radioactive effluents and radiation exposure is being adequately controlled. Include any design features to detect or prevent leakage from outdoor pipes in order to ensure control of effluent releases from the site.

The piping associated with the CST is designed to preclude inadvertent or unidentified leakage to the environment. Per DCD Section 12.1.2.2.3, "The piping, where possible, was constructed of seamless pipe as a means to reduce radiation accumulation on the seam."

In addition, the buried portion of the CST piping will be enclosed within a pipe chase or a guard pipe and monitored for leakage.

These features substantially reduce the potential for unmonitored and uncontrolled releases to the environment.

The description of the pipe chase/guard pipe will be implemented in Chapter 11, Subsection 11.2.1.2 of the next revision of the GEH ABWR DCD as shown in Enclosure 2.

4) Update the Chapter 12 radiation zone drawings of the GEH ABWR DCD, to include the location of the CST, including radiation zoning for the CST.

The CST will be radiation zone designation, A, "uncontrolled, unlimited access"; and, therefore, as shown in Enclosure 3, Figure 12.3-50 will be updated to designate radiation zone "A".

Figures 1.2-25 and 12.3-70 in the GEH ABWR DCD will be updated in the next revision of the ABWR DCD as shown in Enclosure 3 to show the CST position consistent with Figure 12.3-50.

Impact on DCD for RAI 12.02-2:

The following subsections, tables, and figures are revised as shown in the markups provided in Enclosure 2 and 3 of MFN 15-003:

- DCD Tier 2, Table 1.9-1 – Enclosure 2 Markups
- DCD Tier 2, Subsection 11.2.1.2 – Enclosure 2 Markups
- DCD Tier 2, Subsection 12.2.1.2.9.6 (new) – Enclosure 2 Markups
- DCD Tier 2, Subsection 12.2.3.2 (new) – Enclosure 2 Markups
- DCD Tier 2, Table 12.2-5a – Enclosure 2 Markups
- DCD Tier 2, Figure 1.2-25 – Enclosure 3 Markups
- DCD Tier 2, Figure 12.3-50 – Enclosure 3 Markups
- DCD Tier 2, Figure 12.3-70 – Enclosure 3 Markups

NRC Request for Supplemental Information:

(1) A COL Information Item is an acceptable approach, but should state that the shielding provided for the CST ensure that dose to the public meets public dose criteria/requirements (not asking that a specific number be stated).
(2) *Indicate where the leakage monitors alarm (e.g., MCR).*
(3) *Address provisions to preclude rainwater from entering the CST dike/containment area and causing introduction of impurities into LWMS.*

GEH Response to Supplemental Information Request:

(1) A COL Information Item is an acceptable approach, but should state that the shielding provided for the CST ensure that dose to the public meets public dose criteria/requirements (not asking that a specific number be stated).

Normal operation doses to the public per 10CFR50 Appendix I are calculated from radioactive materials in gaseous and liquid effluents produced during normal conditions, including expected occurrences. There is no component of shine from tanks or other equipment included because there is no transport mechanism for that radiation to reach the public. The purpose of the shielding for the CST is to protect workers in close proximity to the CST. The COL item states that there should be adequate shielding so that the dose rate around the CST is designated as the lowest radiation zone (≤ 6 μSv/hr) which has negligible impact to workers. The CST shielding has no impact on doses to the public.

There are no changes to the COL item added in Subsection 12.2.3.2, as part of GEH's response to RAI 12.02-2.

(2) Indicate where the leakage monitors alarm (e.g., MCR).

Both the CST liquid level and the pipe leakage detection system alarm in the main control room.

The description of the pipe leakage alarm location will be added to Chapter 11, Subsection 11.2.1.2 in the next revision of the GEH ABWR DCD as shown in Enclosure 2.

(3) Address provisions to preclude rainwater from entering the CST dike/containment area and causing introduction of impurities into LWMS.

Description about the CST dike design precluding to the extent possible rainwater from entering the CST dike/containment area will be added to Chapter 11, Subsection 11.2.1.2 in the next revision of the GEH ABWR DCD as shown in Enclosure 2.

As part of this revision, the guard pipe option will be removed from Chapter 11, Subsection 11.2.1.2 which was added as part of the original GEH RAI response. This option is being remove because the CST piping is seismic category 1 pipes and they will all be in concrete chases. Chapter 11, Subsection 11.2.1.2 will be updated in the next revision of the GEH ABWR DCD as shown in Enclosure 2.

Impact on DCD for Supplemental Information Request:

The DCD Tier 2, Chapter 11.2.1.2 is being revised. The ABWR DCD R5 revised marked up pages are provided in Enclosure 2.

(Please note that below is GEH's original response to RAI 12.02-3 for convenience)

NRC Request for Additional Information 12.02-3:

10 CFR 52.57(a) requires that an application for design certification renewal contain all information necessary to bring up to date the information and data contained in the previous application. The NRC staff views this requirement as including the correction of known errors. 10 CFR 52.59(a) also requires, in pertinent part, a finding of compliance with the regulations in effect at the time of original certification in order to issue a renewed design certification. 10 CFR 20.1301(d)(1997) requires that the applicant comply with the standards in 40 CFR Part 190. GEH ABWR DCD Tier 2, Section 12.2.2.4 states, "For complete evaluations for compliance to 40 CFR Part 190, gamma shine evaluations are not contained in this document, since adequate detail for skyshine evaluations from the turbine complex are required in DAC Table 3.2." However, in reviewing Tier 1, Table 3.2, all of the items in Table 3.2 are designated as "Acceptance Criteria", including Table 3.2a, item 4, which is the item in Table 3.2 associated with 40 CFR 190 compliance, instead of "Design Acceptance Criteria". Other DAC in the GEH ABWR DCD specifically include the designation, "Design Acceptance Criteria" in order to differentiate DAC from other types of IT AAC. Please change the designation of Table 3.2a Item 4 to correct this discrepancy.

GEH Response to RAI 12.02-3:

GEH agrees. The designation of Table 3.2a Item 4 has been updated to "Design Acceptance Criteria".

Impact on DCD for RAI 12.02-3:

DCD, Tier 1, Table 3.2a Item 4, is revised as shown in Enclosure 2 of MFN 15-003.

NRC Request for Supplemental Information:

For RAI 12.02-3, make all items in Tier 1 Tables 3.2a and 3.2b Design Acceptance Criteria" items.

GEH Response to Supplemental Information Request:

The designation of all Table 3.2a and 3.2b items has been updated to "Design Acceptance Criteria".

Impact on DCD for Supplemental Information Request:

The DCD Tier 1, Table 3.2a and Table 3.2b are being revised. The ABWR DCD R5 revised marked up pages are provided in Enclosure 2.

Enclosure 2

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GEH Supplemental Response to RAIs 12.02-2 and 12.02-3

ABWR DCD DRAFT Revision 6 Markups

The Liquid Radwaste System is designed to treat process liquids with radionuclide concentrations associated with the design basis fuel leakage and produce water suitable for recycle to condensate storage. Plant water balance considerations may require the discharge of processed liquids to the environs, in which case concentrations of radionuclides in the effluent will meet the requirements of 10CFR20. Radiation exposure to persons in unrestricted areas resulting from liquid waste discharged during normal operation and anticipated operational occurrences will be less than the values specified in 10CFR50, Appendix I. Liquid discharge to the canal may be initiated from only one sample tank at a time. The discharge sequence is initiated manually. No single error or failure will result in discharge. The design will maintain occupational exposure as low as practicable in accordance with NRC Regulatory Guide 8.8 while operating with the design basis fuel leakage.

The low conductivity waste (LCW) filters, mixed-bed demineralizers and concentrators are pressure vessels. The collection and sample tanks operate at atmospheric pressure.

INSERT: The condensate storage tank dike is designed to preclude rainwater to the extent possible from entering the CST dike/containment area and causing introduction of impurities into the liquid radwaste management system.

The Liquid Radwaste System is essentially a manual-start and automatic-stop process. Process and radiation instruments are described in Section 11.5. The instrumentation allows for the initiation of processing from the shielded control room area. To ensure that the system performs its intended function in the event of failure of key components, redundancy is provided.

Input to parallel tankage is a feature of the design. Upon high level signals, inputs are automatically routed to a parallel tank. If input should continue, high-high level results in annunciation in the radwaste control room. The state of system operation such as water level of tanks, position of valves and pump operating condition are continuously shown on the radwaste system control panels. The operator will be able to see the changes in the system when the automatic transfer has occurred. Where practical, individual tanks and process equipment are located in separately shielded rooms. Pumps and valves in general are located in dedicated operating galleries. Piping to and from these pumps and valves penetrate shield walls only to the extent necessary to connect to the process equipment. Runs of piping between process equipment are contained either within the shielded areas or shielded pipe runs so that operating personnel exposure is kept to a minimum.

INSERT before the comma: or the Turbine Building

The Condensate storage tank, which is located outdoors, has liquid level monitoring with alarms in the control room. The tank overflows, drains and sample lines are routed to the radwaste system. A dike is provided around the tank to prevent runoff in the event of a tank overflow. A drain within the dike is routed to the radwaste system. The structure for the transfer pumps will be integrated in the dike, as well as the interfaces with any pipe chases ~~or guard pipes.~~ The buried portion of the condensate storage tank piping will be enclosed within a pipe chase ~~or a guard pipe~~ and monitored for leakage.

INSERT before the period: which will alarm in the main control room

All tanks located outside reactor containment and containing radioactive liquids are indoors and are provided with liquid level monitoring and high liquid level conditions are alarmed locally and in the main control room. All Tank overflows, drains and sample lines are sent to the radwaste system. All tanks have curbs or elevated thresholds with floor drains routed to the

3.2 Radiation Protection

Design Description

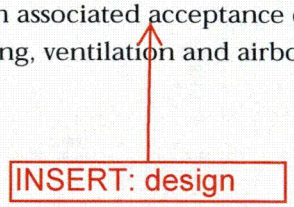
The ABWR design provides radiation protection features to keep exposures for both plant personnel and the general public below allowable limits. This section applies to the radiological shielding and ventilation design of the Reactor Building, Turbine Building, Control Building, Service Building, and Radwaste Building.

The plant design provides radiation shielding for rooms, corridors and operating areas commensurate with their occupancy requirements. Shielded cubicles, labyrinth access and provisions for temporary shielding are used to reduce exposure. Under accident conditions, plant shielding designs permit operators to perform required safety functions in vital areas of the plant. A vital area is an area which will or may require occupancy to permit an operator to aid in the mitigation of or recovery from an accident. In addition to protection of operating personnel, the plant design provides radiation shielding to protect the general public.

Plant ventilation systems maintain concentrations of airborne radionuclides at levels consistent with personnel access requirements. In addition, airborne radioactivity monitoring is provided for those normally occupied areas of the plant in which there exists a significant potential (greater than 0.1 per year) for airborne contamination.

Inspections, Tests, Analyses and Acceptance Criteria

Tables 3.2a and 3.2b provide a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the ABWR plant shielding, ventilation and airborne monitoring equipment.



INSERT: Design

Table 3.2a Plant Shielding Design

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The plant design shall provide radiation shielding for rooms, corridors and operating areas commensurate with their occupancy requirements.	1. An analysis of the expected radiation levels in each plant area will be performed to verify the adequacy of the shielding design. This analysis shall consider the following: a. Confirmatory calculations shall consider significant radiation sources (greater than 5% contribution) for an area. Radiation source strength in plant systems and components will be determined based upon an assumed source term of 3,700 MBq/s offgas release rate (after 30 minutes decay), a 11.1 MBq/gram-steam N-16 source term at the vessel exit nozzle, and a core inventory commensurate with a 4005 MW_t equilibrium core at 51.6 kW/liter. Source terms shall be adjusted for radiological decay and buildup of activated corrosion and wear products. b. Commonly accepted shielding codes, using nuclear properties derived from well known references (such as Vitamin C and ANSI/ANS-6.4) shall be used to model and evaluate plant radiation environments. (1) For non-complex geometries, point kernel shielding codes (such as QAD or GGG) shall be used.	1. Maximum expected radiation dose rates in each plant area (deep dose equivalent measured at 30 cm from the source of the radiation, not contact dose rates) are no greater than the dose rates specified for the following zones, based on the access requirements of that area for plant operation and maintenance. Zone / Dose Rate (μSv/h) / Access Requirements A / ≤6 / Uncontrolled, unlimited access. B / <10 / Controlled, unlimited access. C / <50 / Controlled, limited access 20 h/week. D / <250 / Controlled, limited access 4 h/week. E / <1000 / Controlled, limited access 1 h/week. F / ≥1000 / Restricted, infrequent access. Authorization required.

INSERT: Design

Table 3.2a Plant Shielding Design (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	(2) For complex geometries, more sophisticated two or three dimensional transport codes (such as DORT or TORT) shall be used.	Plant layout such that access to higher zones (areas with higher dose rates) is from lower zoned areas. Corridors and normal traffic areas are Zone C or less. Control rooms are Zone B or less. Radiation zones for the Reactor Building and Control Building are indicated in Figures 3.2a through 3.2v.
	c. A safety factor shall be applied based upon benchmark comparisons.	
2. The plant design shall provide shielded cubicles, labyrinth access, and space for temporary shielding to reduce radiation exposure from adjacent rooms.	2. Using the methods identified in (1) above, radiation levels present in rooms shall be evaluated for the contribution from adjacent rooms.	2. Shielding design of a room including any temporary shielding is such that radiation from adjacent rooms shall contribute no more than a small fraction (10% or less) of the dose rate or less than 0.6 μSv/h whichever is larger, in the room. For this purpose, the drywell shall be considered a room.
3. The plant radiation shielding design shall permit plant personnel to perform required safety functions in vital areas of the plant (including access and egress of these areas) under accident conditions.	3. An analysis of the expected high radiation levels in each area which will or may require occupancy to permit plant personnel to aid in the mitigation of or recovery from an accident (vital area) shall be performed to verify the adequacy of the plant shielding design. This analysis shall use calculational methods consistent with (1.b) above and a radiation source term (adjusted for radioactive decay) based on the following:	3. Under accident conditions, radiation shielding design allows access to occupancy and egress from areas required to maintain post-accident safety functions such that individual personnel radiation doses do not exceed 0.05 Sv to the whole body, or its equivalent, for the duration of the accident (based on the required frequency of access to each vital area).

INSERT: Design

Table 3.2a Plant Shielding Design (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
3. (continued)	3. (continued) ~~a.~~ Liquid containing systems: 100% of the core equilibrium noble gas inventory, 50% of the core equilibrium halogen inventory and 1% of the equilibrium core inventory of the remaining radionuclides are assumed to be mixed in the reactor coolant and recirculation liquids recirculated by the Residual Heat Removal (RHR) System, the High Pressure Core Flooder (HPCF) System, and the Reactor Core Isolation Cooling (RCIC) System. b. Gas containing systems: 100% of the core equilibrium noble gas inventory and 25% of the core equilibrium halogen activity are assumed to be mixed in the containment atmosphere. For vapor containing systems (such as the main steam lines), these core inventory fractions are assumed to be contained in the reactor coolant vapor space.	3. (continued) For areas requiring continuous occupancy (such as the main control room, technical support center, and emergency operations support center), design dose rates shall not exceed 150 μSv/h (averaged over 30 days).
~~Design Commitment~~	~~Inspections, Tests, Analyses~~	~~Design Acceptance Criteria~~
41. The plant design shall provide radiation shielding to protect the general public outside of the controlled area.	41. Using the methods identified in (1) above, the radiation dose to the maximally exposed member of the general public outside of the controlled area from direct and scattered radiation shine shall be determined.	41. As a result of normal operations, the radiation dose from direct and scattered radiation shine to the maximally exposed member of the public outside of the controlled area is equal to or less than 25 μSv/year.

Note to Editor:
(this is an action to be done, this note itself is not to be included in the revised Table 3.2a)
Remove inserted heading and change the #1s back to #4

INSERT: Design

Table 3.2b Ventilation and Airborne Monitoring

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. Plant design shall provide for containment of airborne radioactive materials and the ventilation system will maintain concentrations of airborne radionuclides at levels consistent with personnel access needs.	1. Expected concentrations of airborne radioactive material shall be calculated by radionuclide for normal plant operations and anticipated operational occurrences for each equipment cubicle, corridor, and operating area requiring personnel access. Calculations shall consider: a. Total ventilation flow rates for each area. b. Typical leakage characteristics for equipment located in each area. c. A radiation source term in each fluid system based upon an assumed offgas rate of 3,700 MBq/s (30 minute decay) appropriately adjusted for radiological decay and buildup of activated corrosion and wear products.	1. Calculation of radioactive airborne concentration shall demonstrate that: a. For normally occupied rooms and areas of the plant (i.e., those areas requiring routine access to operate and maintain the plant), equilibrium concentrations of airborne radionuclides will be a small fraction (10% or less) of the occupational concentration limits listed in 10CFR20 Appendix B, January 1994. b. For rooms that require infrequent access (such as for non-routine equipment maintenance), the ventilation system shall be capable of reducing radioactive airborne concentrations to (and maintaining them at) the occupational concentration limits listed in 10CFR20 Appendix B, January 1994,during the periods that occupancy is required. c. For rooms where access is not anticipated to perform scheduled maintenance or surveillance (such as the backwash receiving tank room), plant design shall provide containment and ventilation to reduce airborne contamination spread to other areas of lower contamination.

INSERT: Design

Table 3.2b Ventilation and Airborne Monitoring (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
2. Airborne radioactivity monitoring shall be provided for those normally occupied areas of the plant in which there exists a significant potential for airborne contamination (greater than 0.1 per year). The airborne radioactivity system shall: a. Have the capability of detecting the time integrated concentrations of the most limiting internal dose particulate and iodine radionuclides in each area equivalent to the occupational concentration limits in 10CFR20, Appendix B, January 1994, for 10 hours. b. Provide a calibrated response, representative of the concentrations within the area (i.e., air sampling monitors in ventilation exhaust streams shall collect an isokinetic sample). c. Provide local audible alarms (visual alarms in high noise areas) with variable alarm setpoints, and readout/annunciation capability.	2. An analysis shall be performed to identify the plant areas that require airborne radioactivity monitoring.	2. Airborne radioactivity monitoring system shall be installed as defined in this certified design commitment.