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MFN 06-066
Supplement 2

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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 7 for the ESBWR Design Certification Application – Process Radiation Monitoring System – RAI Numbers 11.5-12, 11.5-14 and 11.5-16 – Supplement 2**

Enclosure 1 contains supplemental responses to the subject NRC RAIs. These supplemental responses are being provided based on discussions with the NRC on May 16, 2006 and the resultant e-mailed comments provided by the NRC (Enclosure 2). GE's original responses to the subject RAIs were transmitted via the Reference 1 letter.

This letter does not affect any other RAI responses in the Reference 1 letter, with the exception of the supplemental RAI responses contained in the Reference 2 letter.

If you have any questions about the information provided here, please let me know.

Sincerely,

Kathy Sedney for

David H. Hinds
Manager, ESBWR

D068

References:

1. MFN 06-066, Letter from David H. Hinds to U.S. Nuclear Regulatory Commission, *Response to NRC Request for Additional Information Letter No. 7 for the ESBWR Design Certification Application – Process Radiation Monitoring System – RAI Numbers 11.5-4 through 11.5-21, 7.5-1, and 7.5-2,* March 1, 2006
2. MFN 06-066, Supplement 1, Letter from David H. Hinds to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 7 for the ESBWR Design Certification Application – Process Radiation Monitoring System – RAI Numbers 11.5-4 through 11.5-6, 11.5-8, 11.5-10, 11.5-11, 11.5-18, and 11.5-19 – Supplement 1,* August 28, 2006

Enclosures:

1. MFN 06-066, Supplement 2 – Response to Portion of NRC Request for Additional Information Letter No. 7 for the ESBWR Design Certification Application – Process Radiation Monitoring System – RAI Numbers 11.5-12, 11.5-14 and 11.5-16 – Supplement 2
2. MFN 06-066, Supplement 2 – NRC E-mail Transmittal – Evaluation of GE Responses to NRC RAI Letter No. 7 – ESBWR DCD Rev. 1, Tier 2

cc:

WD Beckner	USNRC (w/o enclosures)
AE Cubbage	USNRC (with enclosures)
LA Dudes	USNRC (w/o enclosures)
GB Stramback	GE/San Jose (with enclosures)
eDRF	0000-0056-0308

ENCLOSURE 1

MFN 06-066, Supplement 2

Response to Portion of NRC Request for

Additional Information Letter No. 7

for the ESBWR Design Certification Application

Process Radiation Monitoring System

RAI Numbers 11.5-12, 11.5-14, and 11.5-16

NRC RAI 11.5-12

DCD Table 11.5-5 lists "evaporator bottoms" as a liquid sample processing stream, however, the use of an evaporator is not described in DCD Section 11.2.2. The footnote (*) defining the frequency of daily grab sample collection should be revised from "5 times per week" to 7 times per week. A comparison of the types of analyses listed in DCD Table 11.5-5 is not consistent with that shown in DCD Table 11.5-7, e.g., gross alpha, Sr-89, Sr- 90, tritium, and fission gases are not included. Update text accordingly.

GE Response:

Original response based on comments relevant to DCD Tier 2, Revision 0

In Revision 1 of the DCD issued February 5, 2006, the entries in Table 11.5-5 have been updated to be consistent will DCD Section 11.2.2. The sampling frequencies, and isotopes to be sampled, have been made consistent with the information presented in 11.5-7

Additional response based on comments relevant to DCD Tier 2, Revision 1

A comparison was made between SRP 11.5 Table 2, DCD Table 11.5-5 and plant design in order to identify and provide the requirements of SRP Table 2 where applicable within the plant design.

Per the requirements of SRP 11.5 Table 2, the Chemical Drain Subsystem does not require sample collection criteria.

One line entry on the second page of Table 11.5-5 lists an unidentified system collection and sample tanks with no details being provided for grab sample frequency, analysis, sensitivity, and purpose. This one line entry was the result of a word processor based continuation of the cell starting with 'Detergent Drain Subsystem' found in the last line on the first page as it split between the first and second pages. Without the word processor based continuation of the table as it split between two pages, there would have been no blank cells added by the word processor on top of page two and the description at the bottom of page one would have been correctly presented as, "8. Detergent Drain Subsystem Collection (2) and Sample Tank (2)."

DCD Table 11.5-5 will be revised as noted in the attached markup.

A Note will be added to DCD Table 11.5-5 to provide a definition of "sensitivity" and reference will be made to the Lower Limit of Detection values as provided in 10 CFR 20 Appendix B and as supplemented by RG 1.21.

NRC RAI 11.5-14

DCD Table 11.5-7 provides an incomplete listing of sources of liquid waste streams as compared to that described in DCD Section 11.2.2. The following streams are not listed: Chemical Drains, Equipment Drains, Floor Drains, and DW Sump LCW/HCW Discharge. The nomenclature of the "Liquid Radwaste Effluent" is different than that given in DCD Section 11.2.2. The types of analyses listed in DCD Table 11.5-7 are not consistent with that shown in DCD Table 11.5-5 - see prior comment. Provide a description of the proportional composite sampling system footnoted (**) in this table. Confirm that all tank liquid waste samples used for analysis will be taken as representative samples and that each tank volume will be re-circulated in accordance with the guidance of Section 11.5.II of the SRP. Update text accordingly.

GE Response:

Original response based on comments relevant to DCD Tier 2, Revision 0

In Revision 1 of the DCD issued February 5, 2006, Table 11.5-7 has been updated to reflect the major liquid streams so that the information is consistent with the information contained in Section 11.2.2. The nomenclature has been made consistent with that given in Section 11.2.2. Reference to "proportional composites" has been removed from Table 11.5-7 since it is not applicable to ESBWR. Information has been added to Table 11.5-7 that the ESBWR Liquid Waste Management System is designed to recycle 100% of the liquid radwaste, thus providing a zero liquid release. It is also stated that the liquid waste system has provisions for off-site discharge and if liquid radwaste is discharged, the sampling and analysis will be done per the requirements of RG 1.21.

Additional response based on comments relevant to DCD Tier 2, Revision 1

Additional notes will be added to DCD Table 11.5-7 to both define "Sensitivity" and "Composite", and to list the suggested principal isotopes to be examined during the various liquid effluent analyses.

One extraneous blank line entry in DCD Table 11.5-7 will be deleted as noted in the attached markup.

DCD Table 11.5-7 will be revised as noted in the attached markup

NRC RAI 11.5-16

DCD Table 11.5-8 is inconsistent with Regulatory Guide 1.21 guidance for gaseous effluents as it does not differentiate between batch and continuous releases, nor address principal fission and activation gases. Also, this table does not provide the basis for the listed analytical sensitivities given the threshold levels cited in the regulatory guide. Update text accordingly and ensure consistency with the parallel information presented in DCD Table 11.5-6.

GE Response:

Original response based on comments relevant to DCD Tier 2, Revision 0

In Revision 1 of the DCD issued February 5, 2006, Tables 11.5-6 and 11.5-8 have been updated to indicate those streams which are considered to be "processes" and which streams are "effluents". All gaseous effluents are considered to be "continuous". With respect to the basis for the listed analytical sensitivities, the values were selected to provide assurance that the detection limit be better than that needed to demonstrate compliance with offsite release limits. GE proposes to remove the values from Tables 11.5-6 and 11.5-8 and indicate that the sensitivities, and the specific analyses to be done, be provided at the COL stage as per the guidance in SRP 11.5. This change will be incorporated into Revision 2 of DCD Section 11.5.

Additional response based on comments relevant to DCD Tier 2, Revision 1

A comparison was made between SRP 11.5 Table 1, DCD Table 11.5-6 and plant design in order to identify and provide the requirements of SRP Table 1 where applicable within the plant design.

DCD Table 11.5-6 will be revised as noted in the attached markup.

Additional notes will be added to DCD Table 11.5-8 to define "Sensitivity" and to list the suggested principal isotopes to be examined during the various gaseous effluent analyses.

DCD Table 11.5-8 will be revised as noted in the attached markup.

The extraneous line in DCD Table 11.5-8 after the 'Plant Stack' entry will be deleted as noted in the attached markup.

Table 11.5 –5
Provisions for Sampling Liquid Streams

No.	Process Systems as listed in NUREG-0800, SRP 11.5 Table 2 (Draft Rev. 4)	ESBWR System (s) that Perform the Equivalent SRP 11.5 Function (Note 1)	In Process	In Effluent	
			Grab Notes 2 & 7	Grab Notes 2 & 7	Continuous Notes 2 & 7
1.	Liquid Radwaste (Batch) Effluent System Note 3	Equipment (Low Conductivity Drain Subsystem; Floor (High Conductivity) Drain Subsystem	S&A	S&A, H3	-
2.	Service Water System	Plant Service Water System	-	S&A, H3	(S&A) Notes 6 & 8
3.	Component Cooling Water System	Reactor Component Cooling Water System	S&A	S&A, H3	(S&A) Notes 6 & 8
4.	Spent Fuel Pool Treatment System	Spent Fuel Pool Treatment System	S&A	S&A, H3	(S&A) Notes 6 & 8
5.	Equipment & Floor Drain Collection and Treatment Systems	Low Conductivity Waste (LCW) Drain Subsystem; High Conductivity Waste (HCW) Drain Subsystem; Detergent Drain Subsystem; Chemical Waste Drain Subsystem; Reactor Component Cooling Water System (RCCWS) Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
6.	Phase Separator Decant & Holding Basin Systems	Equipment (Low Conductivity) Drain Subsystem; Floor (High) drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8

No.	Process Systems as listed in NUREG-0800, SRP 11.5 Table 2 (Draft Rev. 4)	ESBWR System (s) that Perform the Equivalent SRP 11.5 Function (Note 1)	In Process	In Effluent	
			Grab Notes 2 & 7	Grab Notes 2 & 7	Continuous Notes 2 & 7
7.	Chemical & Regeneration Solution Waste Systems	Chemical Waste Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
8.	Laboratory & Sample System Waste Systems	Chemical Waste Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
9.	Laundry & Decontamination Waste Systems	Detergent Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
10.	Resin Slurry, Solidification & Baling Drain Systems	Equipment (Low Conductivity) Drain Subsystem; Floor (High) Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
11.	Storm & Underdrain Water System	COL Holder Note 4	-	(S&A, H3) Notes 3 & 6	(S&A) Notes 3 & 6
12.	Tanks and Sumps Inside Reactor Building	Equipment (Low Conductivity) Drain Subsystem; Floor (High) Drain Subsystem; Chemical Waste Drain Subsystem; Detergent Drain Subsystem	-	S&A, H3	(S&A) Notes 6 & 8
13.	Ultrasonic Resin Cleanup Waste Systems	Note 5	-	Note 5	Note 5
14.	Non-Contaminated Waste Water System	COL Holder Notes 3 & 4	-	(S&A, H3) Notes 3,4 & 6	(S&A) Note 4

Notes for Table 11.5 –5
Provisions for Monitoring and Sampling Liquid Streams

Notes for Table 11.5-5:

Note 1. *Table 11.5-5 addresses sampling provisions for BWRs as identified in Table 2 of SRP 11.5. For process systems identified for BWRs in Table 2, but not shown in Table 11.5-5, those systems are not applicable to ESBWR. In some cases, there are multiple subsystems that are used to perform the overall equivalent SRP function and are listed as such in the column.*

Note 2 *S&A=Sampling & Analysis of radionuclides, to include gross radioactivity, identification and concentration of principal radionuclides and concentration of alpha emitters; R=Gross radioactivity (beta radiation, or total beta plus gamma); H3=Tritium*

Note 3 *Liquid Radwaste is processed on a batch-wise basis. The Liquid Waste Management System sample tanks can be samples for analysis of the batch. See Subsection 11.2.2.2 for more information on Liquid Radwaste Management.*

Note 4 *The COL Holder will provide design of wastewater effluent systems that monitor the storm, the cooling system tower blow down and sanitation wastes. See Subsection 9.2.9.5 for additional information.*

Note 5 *The ESBWR does not include ultrasonic resin cleanup waste system at this time. Should one be installed, the Liquid Waste Management System would provide sampling and monitoring provisions.*

Note 6 *The use of parenthesis indicates that these provisions are required only for the systems not monitored, sampled, or analyzed (as indicated) prior to release by downstream provisions.*

Note 7 *The sensitivity of detection, also defined here as the Lower Limit of Detection (LLD), for each indicated measured variable, will be based on the applicable radionuclide (or collection of radionuclides as applicable) as given in 10 CFR 20 Appendix B and as supplemented by RG 1.21.*

Note 8. *Processed through radwaste Liquid Waste Management System (LWMS) prior to discharge. Therefore, this process system is monitored, sampled, or analyzed prior to release by downstream provisions. See Note 6 above. Depending on Utility's discretion, additional sampling lines may be installed. Continuous Effluent sampling is not required per Standard Review Plan 11.5 Draft Rev. 4, April 1996, Table 2 for this system function.*

Table 11.5 –6
Provisions for Sampling Gaseous Streams

No.	Process System as listed in NUREG-0588, SRP 11.5 Table 1 (Draft Rev 4)	ESBWR System (s) that Perform the Equivalent SRP 11.5 Function (Note 1)	Sample Provisions (Note 2)		
			In Process	In Effluent	
			Grab	Grab	Continuous
1.	Waste Gas Holdup System	Offgas System (Charcoal Bed portion, i.e., Offgas Post-treatment)	-	NG, H3	I
2.	Condenser Evacuation System	Offgas System (Cooler Condenser portion, i.e., Offgas Pre-treatment)	I	NG, H3	Note 3
3.	Vent & Stack Release Point System	Plant Stack	I	NG, H3	I
4.	Containment Purge Systems	Containment Inerting System	I	NG, H3	Note 4
5.	Auxiliary Building Ventilation System	Reactor Building HVAC System	I	NG, H3	Note 4
6.	Fuel Storage Area Ventilation System	Fuel Building HVAC System	I	NG, H3	I
7.	Radwaste Area Vent Systems	Radwaste Building HVAC System	I	NG, H3	I
8.	Turbine Gland Seal Condenser Vent System	Main Turbine Gland Seal Steam Condenser Exhaust	I	NG, H3	Note 5
9.	Mech. Vacuum Pump Exhaust (Hogging System)	Condenser Air Removal System	Note 6	Note 7	Note 5
10.	Evaporator Vent Systems	Main Turbine Gland Seal	I	NG,	Note 5

No.	Process System as listed in NUREG-0588, SRP 11.5 Table 1 (Draft Rev 4)	ESBWR System (s) that Perform the Equivalent SRP 11.5 Function (Note 1)	Sample Provisions (Note 2)		
			In Process	In Effluent	
			Grab	Grab	Continuous
		Steam Condenser Exhaust		H3	
11.	Pre-treatment Liquid Radwaste Tank Vent Gas Systems	Radwaste Building HVAC System	I	NG, H3	I
12.	Turbine Building Vent Systems	Turbine Building Combined Ventilation Exhaust	I	NG, H3	I

Notes for Table 11.5-6:

1. Table 11.5-6 addresses sampling provisions for BWRs as identified in Table 1 of SRP 11.5. For process systems identified for BWRs in Table 2 of SRP 11.5, but not shown in Table 11.5-6, those systems are not used for ESBWR.
2. NG = Noble Gas; I = Iodine 131; He = Tritium
3. Continuous iodine sampling provided by downstream Offgas Post-treatment radiation Monitoring.
4. Continuous iodine sampling provided by downstream Plant Stack radiation Monitoring.
5. Continuous iodine sampling provided by downstream Turbine Building Combined Exhaust radiation Monitoring.
6. Grab sampling for iodine provided by the Turbine Building Combined Exhaust Monitoring.
7. Grab sampling for Noble Gas and Tritium is provided by the Turbine Building Combined Exhaust Monitoring.

Table 11.5-7

Radiological Analysis Summary of Liquid Effluent Samples

Sample Description	Sample Frequency	Analysis	Sensitivity (MBq/m^3)****	Purpose
1. Liquid Radwaste Effluent Discharge *	Weekly **	Ba/La-140 and I-131	***	Effluent discharge record
Composite of all discharges *****	Monthly	Gamma Spectrum	***	
		Tritium	***	
		Gross alpha	***	
		Dissolved gas	***	
	Quarterly	Sr-89 and Sr-90	***	

Notes for Table 11.5-7:

* ESBWR Radwaste is processed on a batch basis. If a tank is to be discharged, analysis will be performed on each batch.

** The ESBWR Liquid Waste Management System (LWMS) is designed to recycle 100% of the liquid radwaste (zero liquid release). The LWMS system has provisions for off-site discharge. If liquid radwaste is discharged, the sampling and analysis will be done per the requirements of RG 1.21.

*** The sensitivity of detection (also defined here as the Lower Limit of Detection (LLD)) for each indicated radionuclide (or collection of radionuclides as applicable) will be as defined in 10 CFR 20 Appendix B and as supplemented by RG 1.21.

**** The principal gamma emitters for which the LLD specification applies includes the following radionuclides: MN-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, and Ce-141. This list does not mean that only these nuclides are to be

considered. Other gamma energy peaks that are identifiable, together with those of above radionuclides, shall be analyzed and reported per RG 1.21.

***** A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen that is representative of the liquids released.

Table 11.5-8

Radiological Analysis Summary of Gaseous Effluent Samples

Sample Description	Sample Frequency*	Analysis	Sensitivity (MBq/m^3)***	Purpose
1. Turbine Building Combined Ventilation Exhaust	Weekly	Gross β	**	Effluent record
		I-131	**	
		Ba/La-140	**	
	Monthly	Gamma spectrum	**	Effluent record
		I-133 and I-135	**	
		Tritium	**	
		Gross alpha	**	
	Quarterly	Sr-89 and Sr-90	**	Effluent record
2. Plant Stack	As above	As above	**	Effluent record
3. Radwaste Building Ventilation Exhaust	As above	As above	**	Effluent record
4. Fuel Building Combined Ventilation Exhaust	As above	As above	**	Effluent record

Notes for Table 11.5-8:

* All frequencies of sampling will be in accordance with RG 1.21.

** The sensitivity of detection (also defined here as the Lower Limit of Detection (LLD)) for each indicated radionuclide (or collection of radionuclides as applicable) will be as defined in 10 CFR 20 Appendix B and as supplemented by RG 1.21.

*** The principal gamma emitters for which the LLD specification applies includes the following radionuclides: Kr-85, Kr-88, Xe-133, Xe=133m, Xe-135, and Xe-138 in noble gas releases, and Mn-554, Fe-59, Co-58, Co-60, Zn-65, Mo-99, I-131, Cs-134, Cs-137, Ce-141, and Ce-144 in Iodine and Particulate releases. This list does not mean that only these nuclides are to be considered. Other gamma energy peaks that are identifiable, together with those of the above radionuclides, shall be analyzed and reported per RG 1.21.

ENCLOSURE 2

MFN 06-066, Supplement 2

NRC e-mail Transmittal

Evaluation of GE Responses to NRC RAI Letter No. 7

ESBWR DCD Rev. 1, Tier 2

Evaluation of GE Responses to NRC RAI Letter No. 7
ESBWR DCD Rev. 1, Tier 2

The following comments are provided on the revised Chapter 11.5 subsections of the DCD, Rev. 1, Tier 2. The comments are keyed by RAI numbers as a function of technical or regulatory topics.

A. RAI 11.5-4

Section 11.5.1.1.1 - Radiation Monitors Required for Safety and Protection

The section identifies seven PRMS subsystems that provide or initiate automatic safety functions. A review of the listing indicates that three systems are missing: Offgas Post-treatment, Main Steam Line, and Liquid Radwaste Discharge. This is contrary to the discussion and listed systems addressing the implementation of GDC 60 in Section 11.5.5.2. Correct or clarify accordingly here and in Section 11.5.5.2, as needed.

B. RAI 11.5-5

Section 11.5.2.2 - Radiation Monitors Required for Plant Operation

The section does not identify provisions, systems, or procedures addressing the detection of radioactivity in non-radioactive systems to prevent unmonitored and uncontrolled releases of radioactive materials in the environment. Correct or clarify accordingly.

C. RAI 11.5-6

Section 11.5.3.1.5 - Isolation Condenser Vent Exhaust RMS

In its description and functions, the discussion does not indicate where discharges from the Isolation Condenser Vent Exhaust goes into. A review of Chapter 9.4 does not indicate how the Reactor Building HVAC Exhaust system capture discharges from the Isolation Condenser Vent Exhaust. Correct or clarify accordingly.

Section 11.5.3.1.6 - Fuel Building Main Area HVAC RMS

The description of the Fuel Building Main Area HVAC RMS is incomplete as it does not include a discussion about whether the associated radiation monitor initiates isolation and closure functions as part of automatic safety functions. Correct or clarify accordingly.

Section 11.5.3.2.2 - Offgas Pre-Treatment RMS

The dynamic response of the Offgas Pre-Treatment RMS is based on a gas release rate ranging from 3.7 MBq/sec to 3.7E+05 MBq/sec. Given the source term basis parameters of Chapter 11.1 (Tables 11.1-1 and 11.1-3) and SRP Chapter 11.3 guidance (3.7 MBq/sec per MWt), it is not clear how this dynamic range was derived. Provide the basis of this dynamic range in light of Chapter 11.1 assumptions. Confirm that the basis of this range is also consistent with the dynamic range given for the Offgas Post-Treatment RMS described in the

following subsection, 11.5.3.2.3.

Section 11.5.3.2.3 - Offgas Post-Treatment RMS

a. Confirm and describe the functions of Skid A and Skid B, as is noted in Table 11.5-1.

b. The fourth paragraph refers to an incorrect section of Part 20. Change "20.1203" to read "20.1302" instead. Note that this error appears throughout the chapter; check and correct accordingly.

c. Although the system description refers to sampling in accordance with ANSI 13.1-1999, the supporting figure (Fig. 11.5-1) does not indicate the presence of an isokinetic probe on that part of the Offgas Post-Treatment System. Correct or clarify accordingly.

Section 11.5.3.2.7 - Reactor Component Cooling Water Intersystem Leakage RMS

a. The description of the Reactor Component Cooling Water Intersystem Leakage RMS does not refer to separate trains, A and B, each with its own radiation monitor. Correct or clarify accordingly.

b. The description of the Reactor Component Cooling Water Intersystem Leakage RMS does not refer to built-in radioactive check sources to check the operability of the system. Confirm that this feature is consistent with the description given in Section 11.5.6.1.

Section 11.5.3.2.12 - Drywell Fission Product RMS

The description of the Drywell Fission Product RMS does not refer to built-in radioactive check sources to check the operability of the system. Confirm that this feature is consistent with the description given in Section 11.5.6.1.

Section 11.5.3.2.14 - Plant Stack RMS

The description of the Plant Stack RMS does not refer to built-in radioactive check sources to check the operability of the system. Confirm that this feature is consistent with the description given in Section 11.5.6.1.

Section 11.5.3.2.15 - Fuel Building Ventilation Exhaust Air Handling Unit (AHU) RMS

The description of the radiation monitoring system refers to alternatively to two different number of channels for the same system. In the first instance, it states "... consists of a total of four channels that monitor the radiation level of the air entering the Fuel Handling Ventilation (FVH) unit area exhaust AHUs." In the second instance, it states "Two channels provide the monitoring." Correct or clarify accordingly.

Section 11.5.3.2.16 - Fuel Building Combined Ventilation Exhaust RMS

The description of the Fuel Building Combined Ventilation Exhaust RMS does not refer to built-in radioactive check sources to check the operability of the system. Confirm that this feature is consistent with the description given in Section 11.5.6.1.

D. RAI 11.5-22 (NEW RAI)

Section 11.5.4.3 - Instrumentation

The tables cited for where information on instrumentation can be found should be changed to include Table 11.5-8, as it is not included here.

E. RAI 11.5-18

Section 11.5.5.4 - Implementation of General Design Criteria 64

A review of the RMS system used to demonstrate compliance with GDC 64 indicates that: (I) the Liquid Radwaste Discharge RMS is omitted from the listing, and (ii) the Turbine Building Combined Ventilation Exhaust RMS is listed twice. Correct or clarify accordingly.

F. RAI 11.5-19

Section 11.5.6.1 - Inspection and Tests

The sentence introducing the second listing of monitoring systems (p.11.5-17) should note that these systems also include, in addition to check sources, provisions for using test signals in checking system operability. Correct or clarify accordingly.

G. RAI 11.5-8

Table 11.5-1 - Process and Effluent Radiation Monitoring Systems

a. The radiological units used to express display channel ranges are inconsistent with those presented in Table 11.5-2 for the same systems and functions. This table uses mSv/h while the other uses MBq/m^3. Also, some of the stated ranges are inconsistent with expected activity levels under accident or abnormal plant conditions, e.g., up to 1 mSv/h for the Isolation Condenser Vent Exhaust, among other systems. Check all listed monitoring systems and correct or clarify all display channels accordingly in both tables.

b. There are two entries for the Turbine Building Combined Ventilation Exhaust, with one showing the sampling line coming from the drywell. Check all listed systems and correct or clarify accordingly.

c. Confirm the number of channels and values stated for the display channel ranges between Skid A and Skid B of the Offgas Post-treatment and Offgas Pre-Treatment monitoring systems in light of the information provided in Sections 11.5.3.2.2 and 11.5.3.2.3. Correct or clarify accordingly.

d. Confirm the number of channels for the display channel ranges for the Fuel Building Ventilation Exhaust AHU in light of the information provided in Section 11.5.3.2.15. Correct or clarify accordingly.

H. RAI 11.5-8

Table 11.5-2 - Process Radiation Monitoring System (Gaseous and Airborne Monitors)

a. The radiological units used to express detection ranges are inconsistent with those presented in Table 11.5-1 for the same systems and functions. This table uses MBq/m^3 while the other uses mSv/h. Also, this table uses units of MBq/m^3 in describing the response range of the Main Steam Line RMS. Check all listed monitoring systems and correct or clarify accordingly throughout in both set of tables.

b. Confirm that all stated detection ranges are correctly estimated in light of the potential for radioactivity for each system. For example, the upper range given for the Refuel Handling Area HVAC Exhaust is "7.3E+06 Bq/m^3" versus a value of "8.0E+05 Mbq/m^3" for the Control Building Air Intake HVAC RMS. Review and correct all effluent concentration detection ranges (MBq/m^3 vs Bq/m^3).

c. Provide the basis of the estimates given for the dynamic detection ranges.

I. RAI 11.5-10

Table 11.5-3 - Key to Radiation Monitors Shown in Figure 11.5-1

a. Confirm and update Table 11.5-3 to indicate that the Reactor Component Cooling Water Intersystem Leakage has two trains, A and B.

b. Confirm and update Table 11.5-3 to indicate that the Offgas Post-Treatment RMS is equipped with two skids, Skid A and Skid B.

J. RAI 11.5-11

Table 11.5-4 - Process Radiation Monitoring System (Liquid Monitors)

a. Confirm and correct the stated dynamic detection range for the Liquid Radwaste Discharge RMS. The lower and upper ranges have the same values, "2.1E+03 MBq/m^3".

b. Provide the basis of the estimates given for the dynamic detection ranges.

K. RAI 11.5-12

Table 11.5-5 - Radiological Analysis Summary of Liquid Process Samples

a. The listed types of analysis are not consistent with SRP Chapter 11.5, Table 2.

For example, the analyses listed for the LCW and HCW tanks do not include all required analyses, such as "S&A" and "H-3" are not listed as part of the suite of radiological analyses described in Table 11.5-5. The suite of analyses defined in SRP Table 2 as "S&A" in the SRP includes "Sampling and analysis of radionuclides, to include gross radioactivity, identification and concentration of principal radionuclides and concentration of alpha emitters." The requirements for tritium (H-3) are addressed separately in SRP Table 2. Check all entries and correct or clarify accordingly for all listed systems.

b. The table does not provide any explanation as to the basis of the stated instrumentation sensitivity. Check entries and correct or clarify accordingly.

c. One line entry on the second page of the table lists an unidentified system collection and sample tanks with no details being provided for gab sample frequency, analysis, sensitivity, and purpose. Check and correct accordingly.

d. The table does not include sample collection criteria for the Chemical Drain Subsystem. Correct or clarify accordingly.

L. RAI 11.5-16

Table 11.5-6 - Radiological Analysis Summary of Gaseous Process samples

The listed types of analysis are not consistent with SRP Chapter 11.5, Table 1. For example, the Containment Atmosphere Drywell does not include iodines and noble gases. The types of analyses identified as "NG" (noble gases) and "I" of SRP Table 1 are not included as part of the suite of radiological analyses described in Table 11.5-6. The suite of analyses defined by "I" in the SRP includes "Iodine radioactivity, radioactivity of other radionuclides in particulate form, and alpha emitters." The requirements for tritium (H-3) are addressed separately in SRP Table 1. Check all entries and correct or clarify accordingly.

M. RAI 11.5-14

Table 11.5-7 - Radiological Analysis Summary of Liquid effluent Samples

a. The table does not provide any explanation as to the basis of the stated instrumentation sensitivity. Clarify accordingly.

b. One line table entry after the "Plant Stack" has no details. Insert system or delete entry if extraneous.

N. RAI 11.5-16

Table 11.5-8 Radiological Analysis Summary of Gaseous Effluent Samples

a. The table does not provide any explanation as to the basis of the stated instrumentation sensitivity. Clarify accordingly.

b. One line entry after the "Plant Stack" has no details. Clarify accordingly.

O. RAI 11.5-3-3

Figure 11.5-1 - Location of Radiation Monitors

a. Provide an explanation (footnote) as to how and where do discharges from the Isolation Condenser Vent Exhaust system tie into the Reactor Building HVAC system.

b. Update drawing to show that the Offgas Post-Treatment RMS is equipped with an isokinetic probe - such as shown for the Turbine Building, Fuel Building, Radwaste Building, and Plant Stack.