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June 7, 2013

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-13123

Subject: **MHI's Amended Response to US-APWR DCD RAI No. 989-6988 (SRP 11.02)**

References:
1) "Request for Additional Information No. 989-9688, SRP Section 11.02 – Liquid Waste Management System", dated January 30, 2013 (ML13030A416).
2) MHI Letter No. UAP-HF-12278, "MHI's Response to US-APWR DCD RAI No. 956-6630 (SRP 11.02)," dated October 16, 2012 (ML12291A861).
3) MHI Letter No. UAP-HF-13066, "MHI's Response to US-APWR DCD RAI No. 989-6988 (11.02)," dated April 5, 2013 (ML13100A003).

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Response to Request for Additional Information No. 989-6988."

Enclosed is the amended response to the one question contained in Reference 1, which was originally responded to in Reference 3. This response was revised to incorporate staff feedback received during a conference call on March 22, 2013.

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittal. His contact information is provided below.

Sincerely,

Yoshiki Ogata,
Executive Vice President
Mitsubishi Nuclear Energy Systems, Inc.
On behalf of Mitsubishi Heavy Industries, Ltd.

Enclosure:

1. Amended Response to Request for Additional Information No. 989-6988

D081
NRO

CC: J. A. Ciocco
J. Tapia

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Docket No. 52-021
MHI Ref: UAP-HF-13123

Enclosure 1

UAP-HF-13123
Docket No. 52-021

Amended Response to Request for Additional Information
No. 989-6988

June 2013

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/7/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: **NO. 989-6988 REVISION 0**

SRP SECTION: **11.02 - LIQUID WASTE MANAGEMENT SYSTEM**

APPLICATION SECTION: **11.02**

DATE OF RAI ISSUE: **01/30/2013**

QUESTION NO.: 11.02-36

Supplemental RAI proposed for US APWR (RAI 956-6630, Question 11.02-35)

1. The 2nd and 3rd paragraph of the applicant's response, discussing the classification of the Auxiliary Building (A/B) structure determination, does not address the RG 1.143 sections below.

Per RG 1.143, the classification of a rad waste structure is defined as:

RG 1.143 Section 5.1
For a given structure housing radwaste processing systems or components, if the total design basis unmitigated radiological release (considering the maximum inventory) at the boundary of the unprotected area is greater than 500 millirem per year or the maximum unmitigated exposure to site personnel within the protected area is greater than 5 rem per year, the external structures are classified as RW-IIa.

RG 1.143 Section 5.2
For a given structure housing radwaste processing systems or components, if the total design basis unmitigated radiological release (considering the maximum inventory) at the boundary of the unprotected area is less than 500 millirem per year and the maximum unmitigated exposure to site personnel within the protected area is less than 5 rem per year, the external structure is classified as RWE-IIb.

The RG logic is committed to by the applicant for structure classification. If the applicant determines that the rad waste source term is large enough to exceed these dose rates or performs actual unmitigated dose calculations exceeding these dose rates indicating a structure classification of RW-IIa, the FSAR needs revised to indicate the reason for the structure classification.

2. DCD revision Section 11.4.4, needs to include the reference for RG 1.143 for the Table 11.4-8 results methodology and needs to reference the RG 1.143 in this section.

3. Many inconsistencies exist in the radionuclides included in the source term tables that are utilized in deriving the A1 and A2 Ratios. Cs, Sr, Ce, Cr, Zr, etc., are missing in some tables and are included in others. The basis of these inconsistencies needs to be explained.

4. FSAR Table 3.2-2 is missing some information in the footnotes, based upon the new RG 1.143 classifications listed for RWMS SSCs. The criteria are incomplete concerning meeting RG 1.143 in footnotes 1 and 3.(6) for the listed RWMS.

5. The responses in the revisions of FSAR Sections 10.4.8, 11.2, 11.3, and 11.4 are incomplete in explaining the provisions of RG 1.143 in these sections.

ANSWER:

1. The classification of the US-APWR Auxiliary Building (A/B) as a RW-IIa structure is based on dose rate calculations that show that the possible radiological exposure due to the total design basis unmitigated release at the boundary of the unprotected area exceeds the value specified in Section 5.1 of RG 1.143. This classification is consistent with the description provided in DCD Section 3.7.2.8.4. A reference to the specific sections within RG 1.143 that contain the criteria used for the classification of the A/B is added to DCD Section 3.7.2.8.4.

2. The classifications for the Solid Waste Management System (SWMS) components, as described in DCD Table 11.4-8, are determined in accordance with the guidance of RG 1.143, Section 5. The methodology applied to the determination of this classification was provided in the response to RAI 956-6630. A reference to RG 1.143 is added to DCD Section 11.4.4 that describes the results methodology for the classifications presented in Table 11.4-8. References to the specific section of RG 1.143 used for the classification methodology are also added to DCD Subsections 10.4.8.2.1 and 11.2.2.

3. The source term tables have been updated and are attached (Tables A-1 through D-3). The "Others" category has been broken down into individual isotopes. Please note that inconsistencies between the states of isotopes in various systems (captured on filter or demineralizer) are due to the pH and water chemistry of the individual systems. For the Waste Holdup Tank (WHT) Table A-1, the fill time (and therefore the decay time of the WHT contents) has been slightly decreased to be more reflective of actual radwaste operations. This decreased decay time led to a slightly higher nuclide concentration in the WHT, causing the classification to change to RW IIa. Accordingly, Table 11.2-20 has been updated for consistency with the attached inventory tables. Additionally, Tables A-2, A-3, C-1, C-2, D-1 and D-3 have been revised from the original RAI response (RAI No. 956-6630) in accordance with the revised WHT source terms and to specifically list the nuclides which were originally shown under the category of "others" in those tables. However, for these six tables, the overall classifications of the respective components did not change from the original RAI response. The remaining tables for component classification have not changed from the original RAI response.

4. A review of DCD Table 3.2-2 shows that all of the components in the Liquid Waste Management System (LWMS), Gaseous Waste Management System (GWMS), SWMS, and Steam Generator Blowdown System (SGBDS) reference footnote 1 for their seismic classification. Footnote 1 states that the classification of these components is in accordance with RG 1.143. The only exceptions to this approach are the containment isolation valves, which are listed as Seismic Category I. To ensure clarity, a reference to the specific criteria within RG 1.143 that are utilized in determining the seismic requirements (Table 2) is added to footnote 1. Information on the specific criteria within RG 1.143 that are used in determining the codes and standards for SSCs (Table 1) is added to footnote 3(6).

Please see attached markup of DCD Table 3.2-2.

5. References to the sections which contain the RG 1.143 classifications and methodology will be added to footnote 1 of DCD Table 3.2-2.

In addition, a reference to RG 1.143 is added to DCD Subsection 11.3.2.1 that describes the results methodology for the classifications of GWMS components presented in Table 11.3-12.

Please see attached markup of DCD Table 3.2-2 and Subsection 11.3.2.1.

Additionally, footnote 5(b) has been revised for consistency to show that augmented quality applies to all three of the RG 1.143 classifications. Please see attached markup of DCD Table 3.2-2.

Impact on DCD

DCD Sections 3.7.2.8.4, 10.4.8.2.1, 11.2.2, 11.3.2.1, and 11.4.4, Table 3.2-2, and Table 11.2-20 are revised as indicated on the attached markup.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

Table A-1 Radioactive Inventory and Classification
of the Waste Holdup Tank

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ag-110m	1.34E-02	1.10E+01	1.10E+01	1.22E-03	1.22E-03	-
Co-58	4.79E-02	2.70E+01	2.70E+01	1.77E-03	1.77E-03	-
Co-60	5.55E-03	1.10E+01	1.10E+01	5.05E-04	5.05E-04	-
Fe-55	1.24E-02	1.10E+03	1.10E+03	1.13E-05	1.13E-05	-
Fe-59	3.06E-03	2.40E+01	2.40E+01	1.28E-04	1.28E-04	-
Mn-54	1.65E-02	2.70E+01	2.70E+01	6.10E-04	6.10E-04	-
Mn-56	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Nb-95	2.87E-03	2.70E+01	2.70E+01	1.06E-04	1.06E-04	-
Np-239	2.49E-02	1.90E+02	1.10E+01	1.31E-04	2.26E-03	-
Pr-144	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Ru-103	7.85E-02	5.40E+01	5.40E+01	1.45E-03	1.45E-03	-
Ru-106	9.19E-01	5.40E+00	5.40E+00	1.70E-01	1.70E-01	-
W-187	3.06E-02	5.40E+01	1.60E+01	5.67E-04	1.91E-03	-
Zn-65	5.17E-03	5.40E+01	5.40E+01	9.57E-05	9.57E-05	-
Zr-95	4.02E-03	5.40E+01	2.20E+01	7.44E-05	1.83E-04	-
Ba-140	1.36E-01	1.40E+01	8.10E+00	9.71E-03	1.68E-02	-
Ce-141	1.55E-03	5.40E+02	1.60E+01	2.87E-06	9.69E-05	-
Ce-143	3.25E-02	2.40E+01	1.60E+01	1.36E-03	2.03E-03	-
Ce-144	4.21E-02	5.40E+00	5.40E+00	7.80E-03	7.80E-03	-
Cr-51	3.25E-02	8.10E+02	8.10E+02	4.02E-05	4.02E-05	-
Cs-132	0.00E+00	2.70E+01	2.70E+01	0.00E+00	0.00E+00	-
Cs-134	4.02E-04	1.90E+01	1.90E+01	2.12E-05	2.12E-05	-
Cs-135m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Cs-136	9.76E-03	1.40E+01	1.40E+01	6.97E-04	6.97E-04	-
Cs-137	5.74E-04	5.40E+01	1.60E+01	1.06E-05	3.59E-05	-
Cs-138	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Eu-154	0.00E+00	2.40E+01	1.60E+01	0.00E+00	0.00E+00	-
I-130	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
I-131	2.11E-02	8.10E+01	1.90E+01	2.60E-04	1.11E-03	-
I-132	1.07E+00	1.10E+01	1.10E+01	9.75E-02	9.75E-02	-
I-133	3.25E-01	1.90E+01	1.60E+01	1.71E-02	2.03E-02	-
I-134	1.91E+00	8.10E+00	8.10E+00	2.36E-01	2.36E-01	-
I-135	8.23E-01	1.60E+01	1.60E+01	5.14E-02	5.14E-02	-
La-140	2.87E-01	1.10E+01	1.10E+01	2.61E-02	2.61E-02	-
Mo-99	7.08E-02	2.70E+01	1.60E+01	2.62E-03	4.43E-03	-

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Mo-101	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Na-24	6.13E-01	5.40E+00	5.40E+00	1.13E-01	1.13E-01	-
Pm-147	0.00E+00	1.10E+03	5.40E+01	0.00E+00	0.00E+00	-
Rb-86	0.00E+00	1.40E+01	1.40E+01	0.00E+00	0.00E+00	-
Rb-88	4.02E+00	2.70E+00	5.40E-01	1.49E+00	7.44E+00	-
Rb-89	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Sr-89	1.45E-03	1.60E+01	1.60E+01	9.09E-05	9.09E-05	-
Sr-90	1.24E-04	8.10E+00	8.10E+00	1.54E-05	1.54E-05	-
Sr-91	1.36E-02	8.10E+00	8.10E+00	1.68E-03	1.68E-03	-
Sr-92	0.00E+00	2.70E+01	8.10E+00	0.00E+00	0.00E+00	-
Tc-99m	7.27E-02	2.70E+02	1.10E+02	2.69E-04	6.61E-04	-
Te-125m	0.00E+00	5.40E+02	2.40E+01	0.00E+00	0.00E+00	-
Te-127m	0.00E+00	5.40E+02	1.40E+01	0.00E+00	0.00E+00	-
Te-129	4.59E-01	1.90E+01	1.60E+01	2.42E-02	2.87E-02	-
Te-129m	1.91E-03	2.20E+01	1.10E+01	8.70E-05	1.74E-04	-
Te-131	1.57E-01	2.70E+00	5.40E-01	5.81E-02	2.91E-01	-
Te-131m	1.78E-02	1.90E+01	1.40E+01	9.37E-04	1.27E-03	-
Te-132	1.86E-02	1.40E+01	1.10E+01	1.33E-03	1.69E-03	-
Te-133m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Te-134	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Y-90	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Y-91	5.36E-05	1.60E+01	1.60E+01	3.35E-06	3.35E-06	-
Y-91m	9.19E-03	5.40E+01	5.40E+01	1.70E-04	1.70E-04	-
Y-92	0.00E+00	5.40E+00	5.40E+00	0.00E+00	0.00E+00	-
Y-93	5.93E-02	8.10E+00	8.10E+00	7.33E-03	7.33E-03	-
H-3	1.91E+01	1.10E+03	1.10E+03	1.74E-02	1.74E-02	-
TOTAL	3.05E+01			2.34E+00	8.55+00	**RW IIa**

Table A-2 Radioactive Inventory and Classification of the LWMS Filters
(except for the detergent drain filter) – After 1 year accumulation

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ag-110m	2.30E-01	1.10E+01	1.10E+01	2.09E-02	2.09E-02	-
Co-58	3.55E-01	2.70E+01	2.70E+01	1.32E-02	1.32E-02	-
Co-60	1.42E-01	1.10E+01	1.10E+01	1.29E-02	1.29E-02	-
Fe-55	2.99E-01	1.10E+03	1.10E+03	2.72E-04	2.72E-04	-
Fe-59	1.47E-02	2.40E+01	2.40E+01	6.12E-04	6.12E-04	-
Mn-54	3.08E-01	2.70E+01	2.70E+01	1.14E-02	1.14E-02	-
Mn-56	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Nb-95	1.09E-02	2.70E+01	2.70E+01	4.02E-04	4.02E-04	-
Pr-144	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Ru-103	3.33E-01	5.40E+01	5.40E+01	6.16E-03	6.16E-03	-
Ru-106	1.81E+01	5.40E+00	5.40E+00	3.36E+00	3.36E+00	-
Zr-95	2.72E-02	5.40E+01	2.20E+01	5.04E-04	1.24E-03	-
TOTAL	1.99E+01			3.43E+00	3.43E+00	**RW IIa**

Table A-3 Radioactive Inventory and Classification of the Waste Demineralizers – after 1 year accumulation

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ba-140	1.99E-01	1.40E+01	8.10E+00	1.42E-02	2.45E-02	-
Ce-141	5.76E-03	5.40E+02	1.60E+01	1.07E-05	3.60E-04	-
Ce-143	5.12E-03	2.40E+01	1.60E+01	2.13E-04	3.20E-04	-
Ce-144	8.07E-01	5.40E+00	5.40E+00	1.49E-01	1.49E-01	-
Cr-51	1.03E-01	8.10E+02	8.10E+02	1.27E-04	1.27E-04	-
Cs-132	0.00E+00	2.70E+01	2.70E+01	0.00E+00	0.00E+00	-
Cs-134	9.88E-03	1.90E+01	1.90E+01	5.20E-04	5.20E-04	-
Cs-135m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Cs-136	1.47E-02	1.40E+01	1.40E+01	1.05E-03	1.05E-03	-
Cs-137	1.64E-02	5.40E+01	1.60E+01	3.04E-04	1.03E-03	-
Cs-138	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Eu-154	0.00E+00	2.40E+01	1.60E+01	0.00E+00	0.00E+00	-
I-130	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
I-131	1.94E-02	8.10E+01	1.90E+01	2.39E-04	1.02E-03	-
I-132	1.18E-02	1.10E+01	1.10E+01	1.07E-03	1.07E-03	-
I-133	3.22E-02	1.90E+01	1.60E+01	1.70E-03	2.01E-03	-
I-134	7.99E-03	8.10E+00	8.10E+00	9.86E-04	9.86E-04	-
I-135	2.59E-02	1.60E+01	1.60E+01	1.62E-03	1.62E-03	-
La-140	5.50E-02	1.10E+01	1.10E+01	5.00E-03	5.00E-03	-
Mo-99	2.23E-02	2.70E+01	1.60E+01	8.25E-04	1.39E-03	-
Mo-101	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Na-24	4.38E-02	5.40E+00	5.40E+00	8.11E-03	8.11E-03	-
Np-239	6.70E-03	1.90E+02	1.10E+01	3.53E-05	6.09E-04	-
Pm-147	0.00E+00	1.10E+03	5.40E+01	0.00E+00	0.00E+00	-
Rb-86	0.00E+00	1.40E+01	1.40E+01	0.00E+00	0.00E+00	-
Rb-88	5.68E-03	2.70E+00	5.40E-01	2.10E-03	1.05E-02	-
Rb-89	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Sr-89	8.36E-03	1.60E+01	1.60E+01	5.22E-04	5.22E-04	-
Sr-90	3.56E-03	8.10E+00	8.10E+00	4.39E-04	4.39E-04	-
Sr-91	6.16E-04	8.10E+00	8.10E+00	7.60E-05	7.60E-05	-
Sr-92	0.00E+00	2.70E+01	8.10E+00	0.00E+00	0.00E+00	-
Tc-99m	2.09E-03	2.70E+02	1.10E+02	7.74E-06	1.90E-05	-
Te-125m	0.00E+00	5.40E+02	2.40E+01	0.00E+00	0.00E+00	-
Te-127m	0.00E+00	5.40E+02	1.40E+01	0.00E+00	0.00E+00	-
Te-129	2.54E-03	1.90E+01	1.60E+01	1.34E-04	1.59E-04	-

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Te-129m	7.36E-03	2.20E+01	1.10E+01	3.35E-04	6.69E-04	-
Te-131	3.12E-04	2.70E+00	5.40E-01	1.15E-04	5.77E-04	-
Te-131m	2.54E-03	1.90E+01	1.40E+01	1.34E-04	1.82E-04	-
Te-132	6.91E-03	1.40E+01	1.10E+01	4.94E-04	6.28E-04	-
Te-133m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Te-134	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
W-187	3.48E-03	5.40E+01	1.60E+01	6.44E-05	2.17E-04	-
Y-90	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Y-91	3.54E-04	1.60E+01	1.60E+01	2.21E-05	2.21E-05	-
Y-91m	3.63E-05	5.40E+01	5.40E+01	6.72E-07	6.72E-07	-
Y-92	0.00E+00	5.40E+00	5.40E+00	0.00E+00	0.00E+00	-
Y-93	2.86E-03	8.10E+00	8.10E+00	3.53E-04	3.53E-04	-
Zn-65	9.31E-02	5.40E+01	5.40E+01	1.72E-03	1.72E-03	-
H-3	0.00E+00	1.10E+03	1.10E+03	0.00E+00	0.00E+00	-
TOTAL	1.53E+00	-	-	1.92E-01	2.15E-01	**RW IIc**

Table B-1 Radioactive Inventory and Classification of the Waste Gas Surge Tanks

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A1	A/A2	Classification
Kr-85m	1.6E+00	2.2E+02	8.1E+01	7.4E-03	2.0E-02	-
Kr-85	8.6E+01	2.7E+02	2.7E+02	3.2E-01	3.2E-01	-
Kr-87	3.6E-02	5.4E+00	5.4E+00	6.7E-03	6.7E-03	-
Kr-88	7.3E-01	2.7E+00	5.4E-01	2.7E-01	1.4E00	-
Xe-131m	2.7E+02	1.1E+03	1.1E+03	2.4E-01	2.4E-01	-
Xe-133m	2.6E+01	2.7E+00	5.4E-01	9.6E+00	4.8E+01	-
Xe-133	1.1E+01	5.4E+02	2.7E+02	2.0E-02	4.0E-02	-
Xe-135m	2.5E-10	2.7E+00	5.4E-01	9.3E-11	4.7E-10	-
Xe-135	1.4E+01	8.1E+01	5.4E+01	1.7E-01	2.5E-01	-
Xe-137	1.1E-43	2.7E+00	5.4E-01	4.1E-44	2.1E-43	-
Xe-138	1.6E-11	2.7E+00	5.4E-01	5.9E-12	2.9E-11	-
Total	4.0E+02	-	-	1.1E+01	5.0E+01	**RW IIa**

Table B-2 Radioactive Inventory and Classification of the Waste Gas Compressor Package

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Kr-85m	1.7E-02	2.2E+02	8.1E+01	7.9E-05	2.2E-04	-
Kr-85	2.7E-01	2.7E+02	2.7E+02	1.0E-03	1.0E-03	-
Kr-87	1.8E-02	5.4E+00	5.4E+00	3.4E-03	3.4E-03	-
Kr-88	1.9E-02	2.7E+00	5.4E-01	7.2E-03	3.6E-02	-
Xe-131m	6.6E-01	1.1E+03	1.1E+03	6.0E-04	6.0E-01	-
Xe-133m	7.2E-02	2.7E+00	5.4E-01	2.7E-02	1.3E-01	-
Xe-133	2.8E-02	5.4E+02	2.7E+02	5.2E-05	1.0E-04	-
Xe-135m	1.4E-01	2.7E+00	5.4E-01	5.0E-02	2.5E-01	-
Xe-135	7.2E-02	8.1E+01	5.4E+01	8.8E-04	1.3E-03	-
Xe-137	3.7E-02	2.7E+00	5.4E-01	1.4E-02	6.8E-02	-
Xe-138	6.6E-02	2.7E+00	5.4E-01	2.4E-02	1.2E-01	-
Total	1.4E+01	-	-	1.3E-01	6.2E-01	**RW IIc**

Table B-3 Radioactive Inventory and Classification of the Charcoal Beds

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Kr-85m	1.2E+00	2.2E+02	8.1E+01	5.4E-03	1.5E-02	-
Kr-85	4.4E+02	2.7E+02	2.7E+02	1.6E+00	1.6E+00	-
Kr-87	2.0E-01	5.4E+00	5.4E+00	3.6E-02	3.6E-02	-
Kr-88	7.0E-01	2.7E+00	5.4E-01	2.6E-01	1.3E+00	-
Xe-131m	2.8E+03	1.1E+03	1.1E+03	2.6E+00	2.6E+00	-
Xe-133m	5.7E+01	2.7E+00	5.4E-01	2.1E+01	1.0E+02	-
Xe-133	5.2E+01	5.4E+02	2.7E+02	9.6E-02	1.9E-01	-
Xe-135m	7.9E-02	2.7E+00	5.4E-01	2.9E-02	1.5E-01	-
Xe-135	8.6E+00	8.1E+01	5.4E+01	1.1E-01	1.6E-01	-
Xe-137	1.6E-03	2.7E+00	5.4E-01	5.8E-04	2.9E-03	-
Xe-138	3.3E-02	2.7E+00	5.4E-01	1.2E-02	6.2E-02	-
I-131	0.0E+00	8.1E+01	1.9E+01	0.0E+00	0.0E+00	-
I-132	1.9E-05	1.1E+01	1.1E+01	1.8E-06	1.8E-06	-
I-133	2.1E-03	1.9E+01	1.6E+01	1.1E-04	1.3E-04	-
I-134	8.6E-05	8.1E+00	8.1E+00	1.1E-05	1.1E-05	-
I-135	5.3E-04	1.6E+01	1.6E+01	3.3E-05	3.3E-05	-
Total	3.4E+02	-	-	2.6E+01	1.1E+02	**RW IIa**

Table B-4 Radioactive Inventory and Classification of the Waste Gas Dryer

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Kr-85m	1.8E-02	2.2E+02	8.1E+01	8.4E-05	2.3E-04	-
Kr-85	4.0E-01	2.7E+02	2.7E+02	1.5E-03	1.5E-03	-
Kr-87	1.1E-02	5.4E+00	5.4E+00	1.9E-03	1.9E-03	-
Kr-88	1.7E-02	2.7E+00	5.4E-01	6.3E-03	3.1E-02	-
Xe-131m	1.2E+01	1.1E+03	1.1E+03	1.1E-02	1.1E-02	-
Xe-133m	1.3E+00	2.7E+00	5.4E-01	4.9E-01	2.4E+00	-
Xe-133	5.1E-01	5.4E+02	2.7E+02	9.4E-04	1.9E-03	-
Xe-135m	7.8E-02	2.7E+00	5.4E-01	2.9E-02	1.5E-01	-
Xe-135	1.1E+00	8.1E+01	5.4E+01	1.4E-02	2.0E-02	-
Xe-137	1.6E-03	2.7E+00	5.4E-01	5.8E-04	2.9E-03	-
Xe-138	3.3E-02	2.7E+00	5.4E-01	1.2E-02	6.2E-02	-
I-131	1.6E-03	8.1E+01	1.9E+01	2.0E-05	8.6E-05	-
I-132	2.3E-04	1.1E+01	1.1E+01	2.1E-05	2.1E-05	-
I-133	2.0E-03	1.9E+01	1.6E+01	1.1E-04	1.3E-04	-
I-134	7.1E-05	8.1E+00	8.1E+00	8.7E-06	8.7E-06	-
I-135	1.0E-03	1.6E+01	1.6E+01	6.5E-05	6.5E-05	-
Total	1.6E+01	-	-	5.6E-01	2.7E+00	**RW IIb**

Table C-1 Radioactive Inventory and Classification of the Spent Resin Storage Tank

Isotope	Activity (Ci)	A1 (Ci)	A2 (Ci)	A/A1	A/A2	Classification
Ba-140	5.28E+02	1.40E+01	8.10E+00	3.77E+01	6.52E+01	-
Ce-141	1.46E+01	5.40E+02	1.60E+01	2.71E-02	9.13E-01	-
Ce-143	1.56E+01	2.40E+01	1.60E+01	6.49E-01	9.74E-01	-
Ce-144	1.95E+03	5.40E+00	5.40E+00	3.61E+02	3.61E+02	-
Cr-51	2.63E+02	8.10E+02	8.10E+02	3.24E-01	3.24E-01	-
Cs-132	0.00E+00	2.70E+01	2.70E+01	0.00E+00	0.00E+00	-
Cs-134	2.38E+01	1.90E+01	1.90E+01	1.25E+00	1.25E+00	-
Cs-135m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Cs-136	3.90E+01	1.40E+01	1.40E+01	2.78E+00	2.78E+00	-
Cs-137	3.94E+01	5.40E+01	1.60E+01	7.30E-01	2.46E+00	-
Cs-138	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Eu-154	0.00E+00	2.40E+01	1.60E+01	0.00E+00	0.00E+00	-
I-130	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
I-131	5.26E+01	8.10E+01	1.90E+01	6.49E-01	2.77E+00	-
I-132	4.30E+01	1.10E+01	1.10E+01	3.91E+00	3.91E+00	-
I-133	1.03E+02	1.90E+01	1.60E+01	5.44E+00	6.46E+00	-
I-134	2.90E+01	8.10E+00	8.10E+00	3.58E+00	3.58E+00	-
I-135	9.29E+01	1.60E+01	1.60E+01	5.80E+00	5.80E+00	-
La-140	1.65E+02	1.10E+01	1.10E+01	1.50E+01	1.50E+01	-
Mo-99	6.41E+01	2.70E+01	1.60E+01	2.37E+00	4.01E+00	-
Mo-101	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Na-24	1.45E+02	5.40E+00	5.40E+00	2.69E+01	2.69E+01	-
Pm-147	0.00E+00	1.10E+03	5.40E+01	0.00E+00	0.00E+00	-
Rb-86	0.00E+00	1.40E+01	1.40E+01	0.00E+00	0.00E+00	-
Rb-88	2.02E+01	2.70E+00	5.40E-01	7.49E+00	3.75E+01	-
Rb-89	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Sr-89	2.08E+01	1.60E+01	1.60E+01	1.30E+00	1.30E+00	-
Sr-90	8.54E+00	8.10E+00	8.10E+00	1.05E+00	1.05E+00	-
Sr-91	2.14E+00	8.10E+00	8.10E+00	2.65E-01	2.65E-01	-
Sr-92	0.00E+00	2.70E+01	8.10E+00	0.00E+00	0.00E+00	-
Tc-99m	7.50E+00	2.70E+02	1.10E+02	2.78E-02	6.82E-02	-
Te-125m	0.00E+00	5.40E+02	2.40E+01	0.00E+00	0.00E+00	-
Te-127m	0.00E+00	5.40E+02	1.40E+01	0.00E+00	0.00E+00	-
Te-129m	1.86E+01	2.20E+01	1.10E+01	8.46E-01	1.69E+00	-
Te-129	9.24E+00	1.90E+01	1.60E+01	4.86E-01	5.78E-01	-
Te-131m	7.84E+00	1.90E+01	1.40E+01	4.13E-01	5.60E-01	-
Te-131	1.12E+00	2.70E+00	5.40E-01	4.14E-01	2.07E+00	-
Te-132	1.97E+01	1.40E+01	1.10E+01	1.41E+00	1.79E+00	-

Isotope	Activity (Ci)	A1 (Ci)	A2 (Ci)	A/A1	A/A2	Classification
Te-133m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Te-134	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Y-90	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Y-91m	1.31E-01	5.40E+01	5.40E+01	2.43E-03	2.43E-03	-
Y-91	8.77E-01	1.60E+01	1.60E+01	5.48E-02	5.48E-02	-
Y-92	0.00E+00	5.40E+00	5.40E+00	0.00E+00	0.00E+00	-
Y-93	9.90E+00	8.10E+00	8.10E+00	1.22E+00	1.22E+00	-
W-187	1.09E+01	5.40E+01	1.60E+01	2.02E-01	6.82E-01	-
Zn-65	2.25E+02	5.40E+01	5.40E+01	4.17E+00	4.17E+00	-
Total	3.93E+03			4.87E+02	5.56E+02	**RW IIa**

Table C-2 Radioactive Inventory and Classification of the Breakpot Tank

Isotope	Activity (Ci)	A1 (Ci)	A2 (Ci)	A/A1	A/A2	Classification
Ba-140	4.41E+00	1.40E+01	8.10E+00	3.15E-01	5.44E-01	-
Ce-141	1.22E-01	5.40E+02	1.60E+01	2.26E-04	7.63E-03	-
Ce-143	1.30E-01	2.40E+01	1.60E+01	5.42E-03	8.13E-03	-
Ce-144	1.63E+01	5.40E+00	5.40E+00	3.01E+00	3.01E+00	-
Cr-51	2.19E+00	8.10E+02	8.10E+02	2.71E-03	2.71E-03	-
Cs-132	0.00E+00	2.70E+01	2.70E+01	0.00E+00	0.00E+00	-
Cs-134	1.99E-01	1.90E+01	1.90E+01	1.05E-02	1.05E-02	-
Cs-135m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Cs-136	3.25E-01	1.40E+01	1.40E+01	2.32E-02	2.32E-02	-
Cs-137	3.29E-01	5.40E+01	1.60E+01	6.10E-03	2.06E-02	-
Cs-138	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Eu-154	0.00E+00	2.40E+01	1.60E+01	0.00E+00	0.00E+00	-
I-130	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
I-131	4.39E-01	8.10E+01	1.90E+01	5.42E-03	2.31E-02	-
I-132	3.59E-01	1.10E+01	1.10E+01	3.27E-02	3.27E-02	-
I-133	8.63E-01	1.90E+01	1.60E+01	4.54E-02	5.39E-02	-
I-134	2.42E-01	8.10E+00	8.10E+00	2.99E-02	2.99E-02	-
I-135	7.76E-01	1.60E+01	1.60E+01	4.85E-02	4.85E-02	-
La-140	1.38E+00	1.10E+01	1.10E+01	1.25E-01	1.25E-01	-
Mo-99	5.35E-01	2.70E+01	1.60E+01	1.98E-02	3.35E-02	-
Mo-101	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Na-24	1.21E+00	5.40E+00	5.40E+00	2.25E-01	2.25E-01	-
Pm-147	0.00E+00	1.10E+03	5.40E+01	0.00E+00	0.00E+00	-
Rb-86	0.00E+00	1.40E+01	1.40E+01	0.00E+00	0.00E+00	-

Isotope	Activity (Ci)	A1 (Ci)	A2 (Ci)	A/A1	A/A2	Classification
Rb-88	1.69E-01	2.70E+00	5.40E-01	6.26E-02	3.13E-01	-
Rb-89	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Sr-89	1.73E-01	1.60E+01	1.60E+01	1.08E-02	1.08E-02	-
Sr-90	7.13E-02	8.10E+00	8.10E+00	8.80E-03	8.80E-03	-
Sr-91	1.79E-02	8.10E+00	8.10E+00	2.21E-03	2.21E-03	-
Sr-92	0.00E+00	2.70E+01	8.10E+00	0.00E+00	0.00E+00	-
Tc-99m	6.26E-02	2.70E+02	1.10E+02	2.32E-04	5.69E-04	-
Te-125m	0.00E+00	5.40E+02	2.40E+01	0.00E+00	0.00E+00	-
Te-127m	0.00E+00	5.40E+02	1.40E+01	0.00E+00	0.00E+00	-
Te-129m	1.55E-01	2.20E+01	1.10E+01	7.07E-03	1.41E-02	-
Te-129	7.72E-02	1.90E+01	1.60E+01	4.06E-03	4.82E-03	-
Te-131m	6.54E-02	1.90E+01	1.40E+01	3.44E-03	4.67E-03	-
Te-131	9.33E-03	2.70E+00	5.40E-01	3.45E-03	1.73E-02	-
Te-132	1.64E-01	1.40E+01	1.10E+01	1.17E-02	1.49E-02	-
Te-133m	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Te-134	0.00E+00	2.70E+00	5.40E-01	0.00E+00	0.00E+00	-
Y-90	0.00E+00	8.10E+00	8.10E+00	0.00E+00	0.00E+00	-
Y-91m	1.10E-03	5.40E+01	5.40E+01	2.03E-05	2.03E-05	-
Y-91	7.32E-03	1.60E+01	1.60E+01	4.58E-04	4.58E-04	-
Y-92	0.00E+00	5.40E+00	5.40E+00	0.00E+00	0.00E+00	-
Y-93	8.27E-02	8.10E+00	8.10E+00	1.02E-02	1.02E-02	-
W-187	9.12E-02	5.40E+01	1.60E+01	1.69E-03	5.70E-03	-
Zn-65	1.88E+00	5.40E+01	5.40E+01	3.48E-02	3.48E-02	-
Total	3.28E+01			4.07E+00	4.64E+00	**RW IIa**

Table D-1 Radioactive Inventory and Classification
of the SGBD Flash Tank

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ag-110m	1.5E-07	1.1E+01	1.1E+01	1.3E-08	1.3E-08	-
Ba-137m	Modeled as Cs-137					
Ba-140	1.5E-06	1.4E+01	8.1E+00	1.0E-07	1.8E-07	-
Ce-143	3.3E-07	2.4E+01	1.6E+01	1.4E-08	2.1E-08	-
Ce-144	4.4E-07	5.4E+00	5.4E+00	8.1E-08	8.1E-08	-
Co-58	5.3E-07	2.7E+01	2.7E+01	2.0E-08	2.0E-08	-
Cr-51	3.7E-07	8.1E+02	8.1E+02	4.5E-10	4.5E-10	-
Cs-136	1.0E-07	1.4E+01	1.4E+01	7.5E-09	7.5E-09	-
Fe-55	1.4E-07	1.1E+03	1.1E+03	1.2E-10	1.2E-10	-
H-3	1.0E-02	1.1E+03	1.1E+03	9.5E-06	9.5E-06	-
I-131	2.4E-07	8.1E+01	1.9E+01	3.0E-09	1.3E-08	-
I-132	5.8E-06	1.1E+01	1.1E+01	5.2E-07	5.2E-07	-
I-133	3.2E-06	1.9E+01	1.6E+01	1.7E-07	2.0E-07	-
I-134	5.5E-06	8.1E+00	8.1E+00	6.8E-07	6.8E-07	-
I-135	6.8E-06	1.6E+01	1.6E+01	4.2E-07	4.2E-07	-
La-140	3.0E-06	1.1E+01	1.1E+01	2.8E-07	2.8E-07	-
Mn-54	1.8E-07	2.7E+01	2.7E+01	6.6E-09	6.6E-09	-
Mo-99	7.6E-07	2.7E+01	1.6E+01	2.8E-08	4.8E-08	-
Na-24	5.7E-06	5.4E+00	5.4E+00	1.1E-06	1.1E-06	-
Np-239	2.6E-07	1.9E+02	1.1E+01	1.4E-09	2.4E-08	-
Rb-88	4.2E-06	2.7E+00	5.4E-01	1.6E-06	7.8E-06	-
Ru-103	8.7E-07	5.4E+01	5.4E+01	1.6E-08	1.6E-08	-
Ru-106	1.0E-05	5.4E+00	5.4E+00	1.9E-06	1.9E-06	-
Sr-91	1.3E-07	8.1E+00	8.1E+00	1.5E-08	1.5E-08	-
Tc-99m	5.4E-07	2.7E+02	1.1E+02	2.0E-09	4.9E-09	-
Te-129	1.6E-06	1.9E+01	1.6E+01	8.5E-08	1.0E-07	-
Te-131	2.3E-07	2.7E+00	5.4E-01	8.5E-08	4.2E-07	-
Te-131m	1.8E-07	1.9E+01	1.4E+01	9.4E-09	1.3E-08	-
Te-132	2.0E-07	1.4E+01	1.1E+01	1.4E-08	1.8E-08	-
W-187	3.0E-07	5.4E+01	1.6E+01	5.6E-09	1.9E-08	-
Y-93	5.1E-07	8.1E+00	8.1E+00	6.3E-08	6.3E-08	-
Sr-89	1.6E-08	1.6E+01	1.6E+01	9.8E-10	9.8E-10	-
Sr-90	1.4E-09	8.1E+00	8.1E+00	1.7E-10	1.7E-10	-
Y-91m	2.5E-08	5.4E+01	5.4E+01	4.6E-10	4.6E-10	-
Y-91	5.9E-10	1.6E+01	1.6E+01	3.7E-11	3.7E-11	-
Zr-95	4.5E-08	5.4E+01	2.2E+01	8.3E-10	2.0E-09	-
Nb-95	3.0E-08	2.7E+01	2.7E+01	1.1E-09	1.1E-09	-
Te-129m	2.2E-08	2.2E+01	1.1E+01	1.0E-09	2.0E-09	-

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Cs-134	4.4E-09	1.9E+01	1.9E+01	2.3E-10	2.3E-10	-
Cs-137	6.5E-09	5.4E+01	1.6E+01	1.2E-10	4.1E-10	-
Ce-141	1.7E-08	5.4E+02	1.6E+01	3.1E-11	1.0E-09	-
Fe-59	3.4E-08	2.4E+01	2.4E+01	1.4E-09	1.4E-09	-
Co-60	6.1E-08	1.1E+01	1.1E+01	5.5E-09	5.5E-09	-
Zn-65	5.9E-08	5.4E+01	5.4E+01	1.1E-09	1.1E-09	-
Total	1.1E-02	-	-	1.7E-05	2.5E-05	**RW IIc**

Table D-2 Radioactive Inventory and Classification
of the SGBD Demineralizer Inlet Filter

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ag-110m	5.5E-03	1.1E+01	1.1E+01	5.0E-04	5.0E-04	-
Co-58	8.7E-03	2.7E+01	2.7E+01	3.2E-04	3.2E-04	-
Co-60	3.4E-03	1.1E+01	1.1E+01	3.1E-04	3.1E-04	-
Fe-55	7.2E-03	1.1E+03	1.1E+03	6.6E-06	6.6E-06	-
Fe-59	3.5E-04	2.4E+01	2.4E+01	1.5E-05	1.5E-05	-
Mn-54	7.3E-03	2.7E+01	2.7E+01	2.7E-04	2.7E-04	-
Nb-95	2.5E-04	2.7E+01	2.7E+01	9.4E-06	9.4E-06	-
Ru-103	8.1E-03	5.4E+01	5.4E+01	1.5E-04	1.5E-04	-
Ru-106	4.5E-01	5.4E+00	5.4E+00	8.3E-02	8.3E-02	-
Zr-95	6.7E-04	5.4E+01	2.2E+01	1.2E-05	3.0E-05	-
Np-239	1.5E-04	1.9E+02	1.1E+01	7.7E-07	1.3E-05	-
Zn-65	2.2E-03	5.4E+01	5.4E+01	4.1E-05	4.1E-05	-
Total	4.9E-01	-	-	8.4E-02	8.4E-02	**RW IIc**

Table D-3 Radioactive Inventory and Classification of the SGBD Demineralizer

Nuclide	Activity A (Ci)	A_1 (Ci)	A_2 (Ci)	A/A_1	A/A_2	Classification
Ba-137m	Modeled as Cs-137					
Ba-140	4.4E-03	1.4E+01	8.1E+00	3.2E-04	5.5E-04	-
Ce-141	1.3E-04	5.4E+02	1.6E+01	2.4E-07	8.1E-06	-
Ce-143	1.1E-04	2.4E+01	1.6E+01	4.6E-06	6.8E-06	-
Ce-144	1.7E-02	5.4E+00	5.4E+00	3.2E-03	3.2E-03	-
Cr-51	2.4E-03	8.1E+02	8.1E+02	3.0E-06	3.0E-06	-
Cs-134	2.2E-04	1.9E+01	1.9E+01	1.2E-05	1.2E-05	-
Cs-136	3.3E-04	1.4E+01	1.4E+01	2.3E-05	2.3E-05	-
Cs-137	3.9E-04	5.4E+01	1.6E+01	7.1E-06	2.4E-05	-
I-131	4.6E-04	8.1E+01	1.9E+01	5.7E-06	2.4E-05	-
I-132	1.3E-04	1.1E+01	1.1E+01	1.2E-05	1.2E-05	-
I-133	6.7E-04	1.9E+01	1.6E+01	3.5E-05	4.2E-05	-
I-135	4.4E-04	1.6E+01	1.6E+01	2.8E-05	2.8E-05	-
La-140	1.2E-03	1.1E+01	1.1E+01	1.1E-04	1.1E-04	-
Mo-99	5.0E-04	2.7E+01	1.6E+01	1.8E-05	3.1E-05	-
Na-24	8.5E-04	5.4E+00	5.4E+00	1.6E-04	1.6E-04	-
Sr-89	1.9E-04	1.6E+01	1.6E+01	1.2E-05	1.2E-05	-
Te-129m	1.8E-04	2.2E+01	1.1E+01	8.0E-06	1.6E-05	-
Te-132	1.5E-04	1.4E+01	1.1E+01	1.1E-05	1.4E-05	-
I-134	5.0E-05	8.1E+00	8.1E+00	6.2E-06	6.2E-06	-
Rb-88	1.4E-05	2.7E+00	5.4E-01	5.2E-06	2.6E-05	-
Sr-91	1.2E-05	8.1E+00	8.1E+00	1.5E-06	1.5E-06	-
Tc-99m	3.2E-05	2.7E+02	1.1E+02	1.2E-07	2.9E-07	-
Te-129	1.9E-05	1.9E+01	1.6E+01	1.0E-06	1.2E-06	-
Te-131	1.0E-06	2.7E+00	5.4E-01	3.8E-07	1.9E-06	-
Te-131m	5.3E-05	1.9E+01	1.4E+01	2.8E-06	3.8E-06	-
W-187	7.2E-05	5.4E+01	1.6E+01	1.3E-06	4.5E-06	-
Y-93	5.1E-05	8.1E+00	8.1E+00	6.3E-06	6.3E-06	-
Sr-90	8.1E-05	8.1E+00	8.1E+00	1.0E-05	1.0E-05	-
Y-91m	2.1E-07	5.4E+01	5.4E+01	4.0E-09	4.0E-09	-
Y-91	8.0E-06	1.6E+01	1.6E+01	5.0E-07	5.0E-07	-
Total	3.1E-01	-	-	4.0E-03	4.4E-03	**RW IIc**

Table 3.2-2 Classification of Mechanical and Fluid Systems, Components, and Equipment (Sheet 60 of 60)

System and Components	Equipment Class	Location	Quality Group	~~10 CFR 50 Appendix B (Reference 3.2-8)~~Quality Assurance Classification[5]	Codes and Standards[3]	Seismic Category[4]	Notes
The system components up to the first piping restraint at the interface between the reactor building and the turbine building	8	T/B	D	~~N/A~~N	4	NS	
63. Secondary side Chemical Injection System (SCIS)							
~~Secondary chemical injection system~~SCIS components	9	T/B	N/A	~~N/A~~N	5	NS	

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Notes:

1. Seismic category meeting Table 2 of RG 1.143 (Reference 3.2-10) is applied, in accordance with the SSC classifications described in Section 10.4.8, 11.2, 11.3, and 11.4. Portions of the Equipment Class 6 SSCs on which seismic category II requirements are imposed are designed to comply with both the requirements of RG 1.143 and seismic category II.

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2. Seismic category meeting RG 1.189 (Reference 3.2-11) is applied. Portions of the Equipment Class 7 SSCs on which seismic category II requirements are imposed are designed to comply with both the requirements of RG 1.189 and seismic category II.
3. Identification number for "Code and Standards"
   (1) ASME Code, Section III, Class 1 (Reference 3.2-14)
   (2) ASME Code, Section III, Class 2 (Reference 3.2-14)
   (3) ASME Code, Section III, Class 3 (Reference 3.2-14)
   (4) RG 1.26 (Reference 3.2-13), Table 1, Quality Standards for Class D

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   (5) Codes and standards as defined in design bases
   (6) Codes and standards, and guidelines provided in Table 1 of RG 1.143 (Reference 3.2-10), for design of SSCs for Radwaste Facility

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   (7) The codes and standards applicable to fire protection systems follow the guidance of RG 1.189 Section 1.7, and National Fire Protection Association 804.
4. ~~Seismic category II SSCs meet the pertinent QA requirements of 10 CFR 50, Appendix B. (Refer to Subsection 3.2.1.1.2)~~Seismic category: The designations "I" or "II" indicate that the design requirements of Seismic Category I or II equipment are applied as described in Subsection 3.2.1 and Section 3.7, Seismic Design. Equipment that is not designated "I" or "II" is designated "NS."

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5. Quality Assurance Classification: The designation "Q" indicates that the quality assurance requirements of 10 CFR 50, Appendix B, are applied in accordance with the quality assurance program described in Chapter 17. The designation "A" indicates that augmented quality assurance requirements are applied, commensurate with the SSCs contribution to safety or credited for regulatory events for one or more of the following reasons:
   a. Nonsafety-related equipment required to be designed in accordance with special seismic design requirements, such as seismic category II requirements. See note 4.
   b. Nonsafety-related equipment required to be designed in accordance with radioactive waste management system requirements from RG 1.143 for Category RW-IIa, RW-IIb, and RW-IIc [See note 3(6)]. The radioactive waste management system components conform to Regulatory Guide 1.143 Table 1 [see note 3(6)].

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   c. Nonsafety-related equipment required to be designed in accordance with fire protection requirements from 10 CFR 50.48 and RG 1.189. A quality assurance program meets the guidance of RG 1.189.
   d. Nonsafety-related equipment not otherwise identified in notes 5(a) though 5(c) and are identified as risk-significant in Table 17.4-1 or credited for regulatory events such as ATWS and SBO.

The designation "N" indicates that neither 10CFR50 Appendix B nor augmented quality standards are required.

~~passes underneath the T/B, the ESWPT is separated on its top and two sides from the T/B basemat elements with a compressible filler material and/or air gap.~~ MIC-03-03-00054

~~The ESWPT is entirely constructed of reinforced concrete. The design philosophy of the ESWPT is stated as follows.~~

- ~~The ESWPT reinforced concrete structure is designed in accordance with the ACI 349-06 code (Reference 3.7-31).~~ MIC-03-03-00066
- ~~The compressible filler is required to be designed (location and thickness) such that it can compress under seismic and other loads, and such that the bearing loads imposed by compression of the filler material under seismic or other displacement are structurally acceptable.~~
- ~~The SSE load condition is the same as for the R/B complex.~~ MIC-03-03-00066
- ~~To determine seismic loads and displacements, and to generate ISRS for design of essential service water piping, a two dimensional SASSI analysis is performed that accounts for soil-structure and structure-structure interaction, if necessary~~. DCD_03.07.02-35
- ~~The SASSI analysis is required to be documented and comply with the same general requirements described for the R/B-PCCV-containment internal structure SASSI analysis with the exception that no stick model is required. Instead, plateSASSI analysis. Shell elements are to be directly included to represent the tunnel in the SASSI model. However, if the T/B is also included in the model for considering the effects of structure-structure interaction, the stick model of the T/B as described in Subsection 3.7.2.8.2 is used.~~ DCD_03.07.02-35 MIC-03-03-00066 DCD_03.07.02-35

3.7.2.8.3 A/B

The A/B contains the US-APWR standard plant radioactive waste processing facility. This facility is designated as Classification RW-IIa in accordance with RG 1.143, the criteria in Sections 5.1 and 5.2 of (Reference 3.7-19). However, the A/B is designed as seismic category II. The seismic, wind, tornado, hurricane, and flood design requirements for seismic category II are more stringent than those of Classification RW-IIa as outlined in RG 1.143 (Reference 3.7-19). The A/B is located on a common basemat with the R/B, PCCV, CIS, East and West PS/B, and ESWPC. The A/B is situated on the west side of the R/B, and has the west PS/B on its south side and the AC/B on its west side. ~~The A/B is located on the west side of the R/B, and has one PS/B on its south side and the AC/B on its west side. The A/B is separated from these structures with expansion joint(s) sufficiently sized to prevent contact between buildings even if the maximum translational and rotational displacements due to a seismic loading (and other loading) were to occur. The minimum sizes of expansion joints to prevent interaction is determined by considering, at all potential interaction locations, the absolute summation of the A/B deflection and the adjacent structures' deflection (R/B, PS/B, and AC/B) obtained from the response spectra or time history analysis results for those structures, except for the AC/B, the deflection results are determined through the applicable code method.~~ DCD_11.02-36 DCD_02-03 S01 MIC-03-03-00054

- Discharge secondary side water to [[waste water system (WWS)]] or liquid waste management system (LWMS) by bypassing normal processing equipment if secondary water chemistry becomes abnormal water conditions.

- Divert from the blowdown demineralizers to [[WWS]] or the condenser if the blowdown water temperature exceeds the predetermined temperature to protect demineralizers resin.

10.4.8.2 System Description

10.4.8.2.1 General Description

The SGBDS flow diagrams are shown in Figures 10.4.8-1 and 10.4.8-2. Classification of equipment and components in the SGBDS is provided in Section 3.2. Table 10.4.8-2 describes the radioactive waste safety classification in accordance with RG 1.143, Section 5 (Reference 10.4-21) for SGBD components. This classification is determined by comparing the radionuclide inventory of each component with A_1 and A_2 values tabulated in 10 CFR 71, Appendix A (Reference 10.4-22). DCD_11.02-35 DCD_11.02-36

The SGBDS equipment and piping are located in the containment, the reactor building, the auxiliary building and the turbine building (T/B). The piping inside these buildings and transiting between buildings is all routed above ground. RCOL2_12.03-12.04-11 S02

The SGBDS consists of a flash tank, regenerative heat exchangers, non-regenerative coolers, filters, demineralizers, piping, valves and instrumentation. The flash tank, regenerative heat exchangers and non-regenerative coolers are provided to cool the blowdown water with heat recovery, while the filters and demineralizers are provided to purify the blowdown water.

One blowdown line per steam generator is provided. The blowdown from each steam generator flows independently to the flash tank. The blowdown water from the flash tank flows via one common line to regenerative heat exchangers and non regenerative coolers. Blowdown is split into two trains ahead of the heat exchangers. Common discharge from the coolers flows to the filters and demineralizers, where the flow is split into two trains. The purified water from the demineralizers flows to the condenser via a common discharge line.

The blowdown line from each steam generator is provided with two flow paths, a line for purifying blowdown water used during normal plant operation and a line for discharging the blowdown water to the [[WWS]] or the condenser used during startup and abnormal water chemistry conditions.

The US-APWR SG's utilize a "peripheral" blowdown system arrangement. In this arrangement, blowdown holes are drilled from approximately 7 inches below the secondary surface of the tubesheet and intersect with the peripheral groove on the secondary face of the tubesheet. This arrangement is shown as Figure 10.4.8-3 and facilitates effective sludge removal from the tubesheet. The blowdown from each steam generator is depressurized by a throttle valve located downstream of the isolation valves. The throttle valves can be manually adjusted to control the blowdown rate.

Table 11.2-2 contains specific inputs for the LWMS. These inputs are taken from ANSI/ ANS 55.6, Table 7 (Ref. 11.2-6).

The reactor coolant drainage system consists of the CVDT and two containment vessel reactor coolant drain pumps. The process flow diagram for this subsystem is presented in Figure 11.2-1(Sheet 3 of 3). CVDT and containment vessel reactor coolant drain pumps are located inside the containment. (Figure 11.5-2e and 11.5-2c).

Major inputs to the reactor coolant drainage system are as follows:

- RCPs seal leakage
- Excess letdown water
- Leakage from reactor vessel flanges
- Reactor coolant loop (RCL) drainage
- Leakage from valves inside the containment
- RCS vent drainage
- ACC drainage
- Pressurizer relief tank drainage

LWMS component data are identified in Table 11.2-3 through Table 11.2-6 and Table 11.2-20. The radioactive waste safety classification in accordance with RG 1.143 Section 5 (Ref. 11.2-3) is determined by comparing the radionuclide inventory of each component with A_1 and A_2 values tabulated in 10 CFR 71, Appendix A (Reference 11.2-28). DCD_11.02-35 DCD_11.02-36
Component American Society of Mechanical Engineers (ASME) Code, seismic design, and quality assurance requirements for the components in the LWMS are shown in Chapter 3, Table 3.2-2. The LWMS complies with the quality assurance requirements of ANSI/ANS-55.6 (Ref. 11.2-6).

The annual average release of nuclides from the plant is determined using the PWR-GALE Code. The code input parameters used are provided in Table 11.2-9. Associated projected annual releases from a single plant are provided in Table 11.2-10.

Components and structures of the mentioned systems are not under adverse vacuum conditions as there are no vacuum conditions existing due to component operations.

11.2.2.1 Liquid Waste Processing System Operation

Radioactive liquid wastes are collected in various collection tanks located within the A/B and reactor building (R/B). The wastes entering these tanks are transferred from a number of locations within the plant including the following:

- Equipment drainage

Table 11.2-20 LWMS Component Classification

Component	Safety Classification
Waste Holdup Tank	RW II~~e~~a
Waste Monitor Tank	RW IIc
Detergent Drain Tank	RW IIc
Detergent Drain Monitor Tank	RW IIc
Chemical Drain Tank	RW IIc
LWMS Filters (Except for the Detergent Drain Filters)	RW IIa
LWMS ~~IX Columns~~Demineralizers	RW IIc
Detergent Drain Filters	RW IIc

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11.3.2.1 Component Description

This section provides a general description of the key GWMS equipment. Specific component design parameters are summarized in Table 11.3-2. Design codes, standards, and materials for construction of these components are summarized in Table 11.3-11, and are consistent with RG 1.143 (Ref. 11.3-2). GWMS component classifications are described in Table 11.3-12. This classification is determined in accordance with the guidance of RG 1.143 Section 5 (Reference 11.3-2) by comparing the radionuclide inventory of each component with A_1 and A_2 values tabulated in 10 CFR 71, Appendix A (Reference 11.3-29). The Equipment Class 6 components are designed in compliance with applicable codes and standards, and guidelines provided in RG 1.143 (Ref. 11.3-2). DCD_11.02-35 DCD_11.02-36

11.3.2.1.1 Waste Gas Compressors

There are two waste gas compressors. The waste gas compressors continuously draw gases from various systems in the plant and compress the gases into the gas surge tanks. One compressor is used for normal operation and is capable of handling the cover gas from a HT. A second compressor is standing by as backup. The waste gas compressors are water sealed centrifugal units and contain gas coolers and moisture separators. The moisture separator level is equipped with a level control valve. Primary makeup water (PMW) is used as seal water during normal operation. Each gas compressor is sized to handle 100% of the rated load during normal operation including AOOs.

11.3.2.1.2 Gas Surge Tanks

Four gas surge tanks are provided. One is normally set up to receive compressed gases from the waste gas compressor. A second gas surge tank is available for discharge. A third gas surge tank is primarily used for temporary storage of cover gas, and the fourth gas surge tank is a backup. The four gas surge tanks are interconnected and any of the four can be used for any of these functions. In addition, each gas surge tank is independent and functions as a redundant unit. In the unlikely event that one is not functional due to a gas explosion, the others remain unaffected.

Each gas surge tank is provided with pressure control valves to automatically isolate the tank when it reaches the predetermined setpoint. The high-pressure signal provides alarms both in the radwaste control room and the MCR.

Each gas surge tank is sized to retain waste gases discharged from the waste gas compressor during normal operation, including AOOs, and plant shutdown conditions. The gas surge tanks are vertical cylindrical tanks and are made of carbon steel.

11.3.2.1.3 Oxygen Analyzer

One non-sparking oxygen analyzer unit containing dual analyzers and monitors is provided downstream of the waste gas dryer to continuously monitor the concentration of oxygen upstream of the charcoal beds. The oxygen content of the waste stream is controlled to preclude the formation of a flammable mixture. The oxygen gas analyzer skid will have automatic control features to automatically isolate the feed to the charcoal

as required to stabilize the liquid for transportation to an approved facility for treatment and disposal.

30 days of on-site storage space is provided for packaged waste. Wastes are packaged in high-integrity containers, shielded filter containers, 55-gallon (200-liter) drums, and boxes. Temporary storage is provided on-site in the A/B next to the truck bay as shown in Figures 11.5-2c. A movable wall is used to shield high-integrity containers located in the on-site storage area. This wall separates the low activity storage from the high-level storage area. There is a notch on the wall to allow high-integrity containers or drums to be moved between the high and low activity storage areas and into the truck bay area.

11.4.4 Component Description

A description of the SWMS components, including the design of the tanks, pumps, and de-watering mobile unit, is shown in Table 11.4-4. The capacities, materials of construction, and applicable codes are included. SWMS component classifications are described in Table 11.4-8. This classification is determined in accordance with the guidance of RG 1.143 Section 5 (Reference 11.4-1) by comparing the radionuclide inventory of each component with A_1 and A_2 values tabulated in 10 CFR 71, Appendix A (Reference 11.4-35). DCD_11.02-35 DCD_11.02-36

11.4.4.1 Tanks

11.4.4.1.1 Spent Resin Storage Tank

Each of the two SRSTs is a cylindrical vertical tank with a hemispherical head and bottom and is sized to collect a volume of spent resin for one fuel cycle of operation (two years). The SRSTs are sized to accommodate normal operation and AOOs including refueling operation.

The tanks are stainless steel pressure vessels for nitrogen gas operation. Each tank is protected by a pressure relief valve and is vented through a breakpot from which the exhaust air is discharged to the vent header in the GWMS.

11.4.4.1.2 Breakpot Tank

The breakpot tank is a cylindrical vertically mounted stainless steel vessel with hemispherical heads. The tank is constructed per standards and design parameters in Table11.4-4. Both SRST vents are routed to a breakpot tank located downstream of the SRST relief valve to minimize the potential for liquids and solids (resin) from entering the vent header.The breakpot tank is equipped with a level alarm indication to transfer the water to the A/B sump and notify the operator of an abnormal condition. The tank will be sized to minimize the possibility of an overflow condition of the spent resin storage tanks (SRSTs) causing fouling of the Gaseous Waste Management System.