



ND-2011-0007  
March 3, 2011

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

Subject: **PSEG Early Site Permit Application**  
**Docket No. 52-043**  
**Response to Request for Additional Information, RAI No. 6, Gaseous**  
**Waste Management System**

- References:
- 1) PSEG Power, LLC letter to USNRC, Application for Early Site Permit for the PSEG Site, dated May 25, 2010
  - 2) RAI No. 6, SRP Section: 11.03 - Gaseous Waste Management System, dated February 3, 2011 (eRAI 5421)

The purpose of this letter is to respond to the request for additional information (RAI) identified in Reference 2 above. This RAI addresses Gaseous Waste Management System, as described in Section 11.3 of the Site Safety Analysis Report (SSAR), as submitted in Part 2 of the PSEG Site Early Site Permit Application, Revision 0.

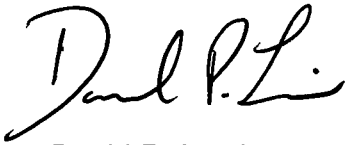
Enclosure 1 provides our response for RAI No. 6, Question No. 11.03-1. Our response to RAI No. 6, Question No. 11.03-1 will result in a revision to the SSAR. Enclosure 2 includes the proposed revisions to the SSAR. Enclosure 3 includes the new regulatory commitment established in this submittal.

If any additional information is needed, please contact David Robillard, PSEG Nuclear Development Licensing Engineer, at (856) 339-7914.

DO79  
WRO

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 3rd day of March, 2011.

Sincerely,

A handwritten signature in black ink, appearing to read "David P. Lewis". The signature is fluid and cursive, with the first name "David" being the most prominent.

David P. Lewis  
Nuclear Development Project Director  
PSEG Power, LLC

- Enclosure 1: Response to NRC Request for Additional Information, RAI No. 6,  
Question No. 11.03-1, SRP Section: 11.03 - Gaseous Waste  
Management System
- Enclosure 2: Proposed Revisions Part 2 – Site Safety Analysis Report (SSAR) Table  
11.3-5 – Gaseous Release Source Terms
- Enclosure 3: Summary of Regulatory Commitments

cc: USNRC Project Manager, Division of New Reactor Licensing, PSEG Site  
(w/enclosures)  
USNRC, Environmental Project Manager, Division of Site and Environmental  
Reviews (w/ enclosures)  
USNRC Region I, Regional Administrator (w/enclosures)

**ENCLOSURE 1**  
**RESPONSE to RAI No. 6**  
**QUESTION 11.03-1**

ND-2011-0007  
March 3, 2011

**Response to RAI No. 6, Question 11.03-1:**

In Reference 2, the NRC staff asked PSEG for information regarding Gaseous Waste Management System, as described in Sections 1.3 and 11.3 of the Site Safety Analysis Report. The specific request was:

*10 CFR 20.1302, Compliance with dose limits for individual members of the public, states that the applicant shall demonstrate that the dose rates to individual members of the public will be met.*

*Table 1.3-7 of the PSEG ESP provides the annual release rate from gaseous effluents for each isotope that is expected to be released from each of the proposed reactor designs. Table 1.3-7 also indicates the bounding release rate for each isotope. This table is mostly consistent with Table 11.3-5, which uses the bounding release rate for each isotope (obtained from Table 1.3-7) to compute a total gaseous release rate for all units (both new and existing units). However, Table 11.3-5 appears to be missing some of the isotopes identified in Table 1.3-7, specifically Kr-90, Rh-103m, Rh-106, Ba-137m, and Xe-139.*

*Please provide this missing information in the PSEG ESP Application.*

**PSEG Response to NRC RAI:**

SSAR Table 1.3-7 contains all radionuclides that are expected to be released as gaseous effluents. SSAR Table 11.3-5 contains all radionuclides from SSAR Table 1.3-7 that are used to calculate the doses due to gaseous effluents and excludes radionuclides Kr-90, Rh-103m, Rh-106, Ba-137m, and Xe-139.

The identified radionuclides are excluded for two reasons. First some of the radionuclides have very short half-lives (Kr-90, Xe-139). They will decay before reaching the offsite receptors and therefore, will not contribute to the dose. The second reason for excluding some radionuclides is because they are short-lived daughter of the longer-lived parents and their effect on dose is included with the parent radionuclide. These radionuclides (and parents) are Ba-137m (Cs-137), Rh-106 (Ru-106), and Rh-103m (Ru-103). Since these radionuclides that are excluded from the dose calculation are either negligible contributors to the dose or are included with the parent radionuclides, excluding these radionuclides will have no effect on the calculated doses.

Note also that there are no dose-factors for these radionuclides in the GASPAR II dose-factor library (GASPAR II is the module in NRCDOSE code package that implements the air release dose models of the NRC Regulatory Guide 1.109).

Two footnotes will be included in SSAR Table 11.3-5 in a future revision of the SSAR clarifying why the specific radionuclides are not included in the table.

**Associated PSEG Site ESP Application Revisions:**

Two footnotes will be added to SSAR Table 11.3-5:

“(1) Radionuclides Kr-90 and Xe-139 are short lived and will decay prior to release to the environment and are therefore, not included in this table.

(2) The emissions from Rh-103m, Rh-106, and Ba-137m are attributed to their parent radionuclides and therefore, are not included in this table.”

Enclosure 2 includes a mark up of the proposed SSAR revision.

**PSEG Letter ND-2011-007, dated March 3, 2011**

**ENCLOSURE 2**

**Proposed Revisions**

**Part 2 – Site Safety Analysis Report (SSAR)**

**Table 11.3-5 – Gaseous Release Source Terms**

**PSEG Site  
ESP Application  
Part 2, Site Safety Analysis Report**

**Table 11.3-5 (Sheet 1 of 3)  
Gaseous Release Source Terms**

Isotope (c, d)	New Unit(s)		Existing Site <sup>(b)</sup> (Ci/yr)	Total (Ci/yr)
	Single Unit <sup>(a)</sup> (Ci/yr)	Dual Unit (Ci/yr)		
Ag-110m	2.00E-06	4.00E-06	-	4.00E-06
Ar-41	3.40E+01	6.80E+01	5.39E-01	6.85E+01
Ba-139	-	-	3.44E+00	3.44E+00
Ba-140	2.70E-02	5.41E-02	2.56E-03	5.66E-02
Br-82	-	-	5.27E-06	5.27E-06
C-14	9.19E+00	1.84E+01	-	1.84E+01
Ce-141	9.19E-03	1.84E-02	7.11E-05	1.84E-02
Ce-144	1.89E-05	3.78E-05	-	3.78E-05
Co-57	8.20E-06	1.64E-05	-	1.64E-05
Co-58	2.30E-02	4.60E-02	1.76E-04	4.62E-02
Co-60	1.30E-02	2.59E-02	8.30E-05	2.60E-02
Cr-51	3.51E-02	7.03E-02	-	7.03E-02
Cs-134	6.22E-03	1.24E-02	-	1.24E-02
Cs-136	5.95E-04	1.19E-03	-	1.19E-03
Cs-137	9.46E-03	1.89E-02	-	1.89E-02
Cs-138	1.70E-04	3.41E-04	-	3.41E-04
Cu-64	1.00E-02	2.00E-02	-	2.00E-02
Fe-55	6.49E-03	1.30E-02	-	1.30E-02
Fe-59	8.11E-04	1.62E-03	-	1.62E-03
H-3	3.5E+02	7.0E+02	2.79E+02	9.79E+02
I-131	2.60E-01	5.19E-01	7.26E-03	5.26E-01
I-132	2.19E+00	4.38E+00	-	4.38E+00
I-133	1.70E+00	3.41E+00	7.53E-02	3.48E+00
I-134	3.78E+00	7.57E+00	-	7.57E+00

**PSEG Site  
ESP Application  
Part 2, Site Safety Analysis Report**

**Table 11.3-5 (Sheet 2 of 3)  
Gaseous Release Source Terms**

Isotope <small>(c, d)</small>	New Unit(s)		Existing Site <sup>(b)</sup> (Ci/yr)	Total (Ci/yr)
	Single Unit <sup>(a)</sup> (Ci/yr)	Dual Unit (Ci/yr)		
I-135	2.41E+00	4.81E+00	-	4.81E+00
Kr-83m	8.38E-04	1.68E-03	-	1.68E-03
Kr-85	3.40E+04	6.80E+04	-	6.80E+04
Kr-85m	1.50E+02	3.00E+02	1.14E-03	3.00E+02
Kr-87	5.30E+01	1.06E+02	-	1.06E+02
Kr-88	1.80E+02	3.60E+02	-	3.60E+02
Kr-89	2.41E+02	4.81E+02	-	4.81E+02
La-140	1.81E-03	3.62E-03	1.01E-03	4.64E-03
Mn-54	5.41E-03	1.08E-02	-	1.08E-02
Mn-56	3.51E-03	7.03E-03	-	7.03E-03
Mo-99	5.95E-02	1.19E-01	1.08E-05	1.19E-01
Na-24	4.05E-03	8.11E-03	-	8.11E-03
Nb-95	8.38E-03	1.68E-02	-	1.68E-02
Ni-63	6.49E-06	1.30E-05	-	1.30E-05
Np-239	1.19E-02	2.38E-02	-	2.38E-02
P-32	9.19E-04	1.84E-03	-	1.84E-03
Pr-144	1.89E-05	3.78E-05	-	3.78E-05
Rb-89	4.32E-05	8.65E-05	-	8.65E-05
Ru-103	3.51E-03	7.03E-03	-	7.03E-03
Ru-106	7.80E-05	1.56E-04	-	1.56E-04
Sb-124	1.81E-04	3.62E-04	-	3.62E-04
Sb-125	6.10E-05	1.22E-04	-	1.22E-04
Sr-89	5.68E-03	1.14E-02	-	1.14E-02
Sr-90	1.20E-03	2.40E-03	-	2.40E-03



**PSEG Site  
ESP Application  
Part 2, Site Safety Analysis Report**

**Table 11.3-5 (Sheet 3 of 3)  
Gaseous Release Source Terms**

Isotope	New Unit(s)			
	Single Unit <sup>(a)</sup> (Ci/yr)	Dual Unit (Ci/yr)	Existing Site <sup>(b)</sup> (Ci/yr)	Total (Ci/yr)
Sr-91	1.00E-03	2.00E-03	1.72E-02	1.92E-02
Sr-92	7.84E-04	1.57E-03	4.10E-02	4.26E-02
Tc-99m	2.97E-04	5.95E-04	1.09E-05	6.06E-04
Te-129m	2.19E-04	4.38E-04	-	4.38E-04
Te-131m	7.57E-05	1.51E-04	1.86E-05	1.70E-04
Te-132	1.89E-05	3.78E-05	-	3.78E-05
W-187	1.89E-04	3.78E-04	-	3.78E-04
Xe-131m	3.50E+03	7.00E+03	2.68E-04	7.00E+03
Xe-133	8.60E+03	1.72E+04	9.99E-01	1.72E+04
Xe-133m	1.80E+02	3.60E+02	1.19E-02	3.60E+02
Xe-135	1.20E+03	2.40E+03	1.15E+00	2.40E+03
Xe-135m	4.05E+02	8.11E+02	-	8.11E+02
Xe-137	5.14E+02	1.03E+03	-	1.03E+03
Xe-138	4.32E+02	8.65E+02	-	8.65E+02
Y-90	4.60E-05	9.19E-05	-	9.19E-05
Y-91	2.41E-04	4.81E-04	-	4.81E-04
Y-91m	-	-	2.40E+00	2.40E+00
Y-92	6.22E-04	1.24E-03	-	1.24E-03
Y-93	1.11E-03	2.22E-03	-	2.22E-03
Zn-65	1.11E-02	2.22E-02	-	2.22E-02
Zr-95	1.60E-03	3.19E-03	-	3.19E-03
Total	4.99E+04	9.97E+04	2.87E+02	1.00E+05

a) Single unit is the PPE value from SSAR Table 1.3-7, and is included for single unit analysis throughout the section.

b) Existing site consists of one BWR (HCGS) and two PWRs (SGS).

c) Radionuclides Kr-90 and Xe-139 are short lived and will decay prior to release to the environment and are therefore, not included in this table.

d) The emissions from Rh-103m, Rh-106, and Ba-137m are attributed to their parent radionuclides and therefore, are not included in this table

Rev. 0

**PSEG Letter ND-2011-0007, dated March 3, 2011**

**ENCLOSURE 3**  
**Summary of Regulatory Commitments**

### ENCLOSURE 3

#### SUMMARY OF REGULATORY COMMITMENTS

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	Programmatic (Yes/No)
PSEG will revise SSAR Table 11.3-5 to incorporate the changes in Enclosure 2 in response to NRC RAI 11.03-1.	This revision will be included in the next update of the PSEG Site ESP application SSAR.	Yes	No