



ND-2011-0009
March 10, 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. 7, Liquid
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. 7, SRP Section: 11.02 - Liquid Waste Management System, dated February 3, 2011 (eRAI 5423)
 - 3) PSEG Power Letter to USNRC, Response to Request for Additional Information, RAI No. 7, dated March 3, 2011.

In Reference 3, PSEG provided a response to NRC Request for Additional Information (RAI) No. 7. After transmittal to NRC, it was noted that the response contained typographical errors. This letter provides a corrected response to RAI No. 7. The technical content of the response to RAI No. 7 has not been changed from that provided in Reference 3. No new regulatory commitments are established in this submittal.

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

DO79
NRC

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 10th 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. 7,
Question No. 11.02-1, SRP Section: 11.02 - Liquid Waste Management
System
- Enclosure 2: Proposed Revisions Part 2 – Site Safety Analysis Report (SSAR) Table
11.2-1 – Liquid 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. 7
QUESTION 11.02-1

ND-2011-0009
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Response to RAI No. 7, Question 11.02-1:

In Reference 2, the NRC staff asked PSEG for information regarding Liquid Waste Management System, as described in Sections 1.3 and 11.2 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 1.3-8 of the PSEG ESP provides the annual release rate from liquid effluents for each isotope that is expected to be released from each of the proposed reactor designs. Table 1.3-8 also indicates the bounding release rate for each isotope. This table is mostly consistent with Table 11.2-1, which uses the bounding release rate for each isotope (obtained from Table 1.3-8) to compute a total liquid release rate for all units (both new and existing units). However, Table 11.2-1 appears to be missing the average annual normal liquid release rate for Ag-110, Ba-137m, Rh-103m, and Rh-106.

Please provide this missing information in the PSEG ESP Application.

PSEG Response to NRC RAI:

SSAR Table 1.3-8 contains all radionuclides that are expected to be released as liquid effluents. SSAR Table 11.2-1 contains all radionuclides from SSAR Table 1.3-8 that are used in the calculation of the doses due to liquid effluents and excludes radionuclides Ag-110, Ba-137m, Rh-103m, and Rh-106.

The reason why these radionuclides are excluded is because they are short-lived daughter products of long-lived parents and their effect on dose is included with the parent nuclide. The excluded radionuclides (and parents) are Ag-110 (Ag-110m), Ba-137m (Cs-137), Rh-103m (Ru-103), and Rh-106 (Ru-106). Since the effect of these radionuclides on the calculated dose is included with the parent radionuclide, excluding these radionuclides will have no effect on the calculated dose.

Note also that there are no dose-factors for these radionuclides in the LADTAP II dose-factor library (LADTAP II is the module in the NRCDOSE code package that implements the liquid release dose models of the NRC Regulatory Guides 1.109 and 1.113).

A footnote will be included in SSAR Table 11.2-1 in a future revision of the SSAR to clarify why the radionuclides are not included in the table.

Associated PSEG Site ESP Application Revisions:

The following footnote will be added to SSAR Table 11.2-1:

“Radionuclides Ag-110, Ba-137m, Rh-103m, and Rh-106 are short lived and their emissions are attributed to their parent radionuclides. Therefore, they are not included in this table.”

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

PSEG Letter ND-2011-0009, dated March 10, 2011

ENCLOSURE 2
Proposed Revisions
Part 2 – Site Safety Analysis Report (SSAR)
Table 11.2-1 – Liquid Release Source Terms

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

**Table 11.2-1 (Sheet 1 of 3)
Liquid Release Source Terms**

Isotope	New Unit(s)			
	Single Unit ^(a) (Ci/yr)	Dual Unit (Ci/yr)	Existing Site ^(b) (Ci/yr)	Total (Ci/yr)
Ag-110m	1.80E-03	3.60E-03	6.67E-05	3.67E-03
Ba-140	5.80E-03	1.16E-02	-	1.16E-02
Br-84	2.00E-05	4.00E-05	-	4.00E-05
Ce-141	2.97E-04	5.94E-04	1.37E-04	7.31E-04
Ce-143	6.10E-04	1.22E-03	-	1.22E-03
Ce-144	5.60E-03	1.12E-02	-	1.12E-02
Co-57	-	-	1.42E-05	1.42E-05
Co-58	9.80E-03	1.96E-02	2.03E-02	3.99E-02
Co-60	1.54E-02	3.08E-02	5.84E-03	3.66E-02
Cr-51	1.70E-02	3.40E-02	1.05E-06	3.40E-02
Cs-134	1.20E-02	2.40E-02	3.99E-04	2.44E-02
Cs-136	2.20E-02	4.40E-02	-	4.40E-02
Cs-137	1.80E-02	3.60E-02	4.17E-03	4.02E-02
Cs-138	8.00E-07	1.60E-06	-	1.60E-06
Cu-64	1.26E-02	2.52E-02	-	2.52E-02
Fe-55	9.46E-03	1.89E-02	1.25E-02	3.14E-02
Fe-59	2.30E-03	4.60E-03	3.10E-07	4.60E-03
H-3	1.66E+03	3.32E+03	6.98E+02	4.02E+03
I-131	3.40E-02	6.80E-02	6.63E-06	6.80E-02
I-132	1.93E-03	3.86E-03	-	3.86E-03
I-133	3.73E-02	7.46E-02	7.25E-07	7.46E-02
I-134	8.10E-04	1.62E-03	-	1.62E-03

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

**Table 11.2-1 (Sheet 2 of 3)
Liquid Release Source Terms**

Isotope	New Unit(s)			
	Single Unit ^(a) (Ci/yr)	Dual Unit (Ci/yr)	Existing Site ^(b) (Ci/yr)	Total (Ci/yr)
I-135	1.50E-02	3.00E-02	-	3.00E-02
La-140	8.00E-03	1.60E-02	2.86E-04	1.63E-02
Mn-54	4.50E-03	9.00E-03	9.28E-04	9.93E-03
Mn-56	2.04E-03	4.08E-03	-	4.08E-03
Mo-99	2.61E-03	5.22E-03	-	5.22E-03
Na-24	6.10E-03	1.22E-02	-	1.22E-02
Nb-95	2.00E-03	4.00E-03	5.62E-08	4.00E-03
Nb-97	-	-	2.36E-05	2.36E-05
Nd-147	2.00E-06	4.00E-06	-	4.00E-06
Ni-63	1.70E-03	3.40E-03	-	3.40E-03
Np-239	9.49E-03	1.90E-02	-	1.90E-02
P-32	5.68E-04	1.14E-03	-	1.14E-03
Pr-143	1.30E-04	2.60E-04	-	2.60E-04
Pr-144	3.16E-03	6.32E-03	-	6.32E-03
Rb-88	2.80E-02	5.60E-02	-	5.60E-02
Ru-103	4.93E-03	9.86E-03	-	9.86E-03
Ru-106	7.35E-02	1.47E-01	-	1.47E-01
Sb-124	4.30E-04	8.60E-04	-	8.60E-04
Sb-125	-	-	1.24E-04	1.24E-04
Sn-117m	-	-	2.11E-04	2.11E-04
Sr-89	3.14E-04	6.28E-04	-	6.28E-04
Sr-90	2.68E-05	5.36E-05	-	5.36E-05

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

**Table 11.2-1 (Sheet 3 of 3)
Liquid Release Source Terms**

Isotope	New Unit(s)			Total (Ci/yr)
	Single Unit ^(a) (Ci/yr)	Dual Unit (Ci/yr)	Existing Site ^(b) (Ci/yr)	
Sr-91	1.25E-03	2.50E-03	-	2.50E-03
Sr-92	4.43E-04	8.86E-04	-	8.86E-04
Tc-99m	5.68E-03	1.14E-02	-	1.14E-02
Te-129	3.10E-04	6.20E-04	-	6.20E-04
Te-129m	1.20E-04	2.40E-04	-	2.40E-04
Te-131	7.60E-05	1.52E-04	-	1.52E-04
Te-131m	3.10E-04	6.20E-04	-	6.20E-04
Te-132	4.80E-04	9.60E-04	-	9.60E-04
W -187	4.60E-04	9.20E-04	-	9.20E-04
Xe-133	-	-	1.38E-03	1.38E-03
Xe-135	-	-	4.48E-05	4.48E-05
Y-91	2.35E-04	4.70E-04	-	4.70E-04
Y-91m	5.00E-05	1.00E-04	-	1.00E-04
Y-92	1.69E-03	3.38E-03	-	3.38E-03
Y-93	1.36E-03	2.72E-03	-	2.72E-03
Zn-65	4.41E-04	8.82E-04	1.17E-04	9.99E-04
Zr-95	1.30E-03	2.60E-03	-	2.60E-03
Total	1.66E+03	3.32E+03	6.98E+02	4.02E+03

- a) Single unit is the PPE value from SSAR Table 1.3-8, and is included for single unit analysis throughout the section.
- b) Existing site consists of one boiling water reactor (BWR) (HCGS) and two pressurized water reactors (PWRs) (SGS).

c) Radionuclides Ag-110, Ba-137m, Rh-103m, and Rh-106 are short lived and their emissions are attributed to their parent radionuclides. Therefore, they not included in this table.

PSEG Letter ND-2011-0009, dated March 10, 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 11.2-1 to incorporate the changes in Enclosure 2 in response to NRC RAI 11.02-1.	This revision will be included in the next update of the PSEG Site ESP application SSAR.	Yes	No