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LR-N25-0003  
January 13, 2025

10 CFR 50.54(q)  
10 CFR 50.4(b)(5)

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

Salem Nuclear Generating Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-70 and DPR-75  
NRC Docket Nos. 50-272 and 50-311

Hope Creek Generating Station  
Renewed Facility Operating License No. NPF-57  
NRC Docket No. 50-354

Subject: Emergency Plan EAL Document Revisions Implemented December 18, 2024

Pursuant to 10 CFR 50.54(q) and 10 CFR 50.4(b)(5), PSEG Nuclear LLC (PSEG) is submitting 10 CFR 50.54(q) Summary Analysis Reports 2024-38, 2024-39, 2024-40, 2024-41.

The following Emergency Preparedness EAL document revisions are included:

- EP-SA-325-237, Rev. 2 – Attachment 6 – Salem EAL Rad Set-Point Calculation Document
- EP-HC-325-236, Rev. 2 – Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document
- EP-SA-325-103, Rev. 2 – Salem Section R - Abnormal Rad Levels/Rad Effluent
- EP-SA-325-140, Rev. 2 – Salem EAL Wall Chart (All Conditions)
- EP-SA-325-203, Rev. 2 – Salem Abnormal Rad Levels/Rad Effluent
- EP-HC-325-103, Rev. 3 – Hope Creek Section R- Abnormal Rad Levels/Rad Effluent
- EP-HC-325-140, Rev. 2 – Hope Creek EAL Wall Chart (All Conditions)
- EP-HC-325-203, Rev. 2 – Hope Creek Abnormal Rad Levels/Rad Effluent

There are no regulatory commitments contained in this letter.

Should you have any questions, or require further information regarding this submittal, please contact Ms. Megean M. Brown at [Megean.Brown@pseg.com](mailto:Megean.Brown@pseg.com).

Respectfully,

Stephen T. Barr  
Manager, Emergency Preparedness

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Enclosure 1 – 10 CFR 50.54(q) Summary Analysis Report 2024-38  
Enclosure 2 – EP-SA-325-237, Rev. 2 - Attachment 6 – Salem EAL Rad Set-Point Calculation Document  
Enclosure 3 - 10 CFR 50.54(q) Summary Analysis Report 2024-39  
Enclosure 4 - EP-HC-325-236, Rev. 2 Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document  
Enclosure 5 - 10 CFR 50.54(q) Summary Analysis Report 2024-40  
Enclosure 6 - EP-SA-325-103, Rev. 2 – Salem Section R- Abnormal Rad Levels/Rad Effluent  
Enclosure 7 - EP-SA-325-140, Rev. 2 – Salem EAL Wall Chart (All Conditions)  
Enclosure 8 - EP-SA-325-203, Rev. 2 – Salem Abnormal Rad Levels/Rad Effluent  
Enclosure 9 – 10 CFR 50.54(q) Summary Analysis Report 2024-41  
Enclosure 10 – EP-HC-325-103, Rev. 3 – Hope Creek Section R- Abnormal Rad Levels/Rad Effluent  
Enclosure 11 - EP-HC-325-140, Rev. 2 – Hope Creek EAL Wall Chart (All Conditions)  
Enclosure 12 - EP-HC-325-203, Rev. 2 – Hope Creek Abnormal Rad Levels/Rad Effluent

cc: USNRC Administrator, Region I  
USNRC Project Manager  
USNRC Senior Resident Inspector, Salem  
USNRC Senior Resident Inspector, Hope Creek  
NJDEP Bureau of Nuclear Engineering  
PSEG Station Commitment Tracking Coordinator

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**ENCLOSURE 1**

**10 CFR 50.54(q) Summary Analysis Report 2024-38,  
EP-SA-235-237, Rev. 2 Attachment 6 – Salem EAL Rad Set Point Calculation Document**

**(4 Total Pages)**

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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Revision 0

**50.54Q I.D. Number:** 2024-38

**50.54Q Title:** EP-SA-325-237, Rev. 2, Attachment 6 – Salem EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

**Description of the change made to the Emergency Plan/Procedures:**

The proposed change revises EAL Rad set point calculations based on changes to the Exclusion Area Boundary (EAB) as documented in License Amendment ML24145A177.

The impacted Abnormal Rad Level/Rad Effluent EALs include: RU1.1, RU1.2, RA1.1, RS1.1, RG1.1

References updated to include:

- Salem ODCM Rev. 30
- License Amendment Request for Exclusion Area Boundary change, LAR S23-04
- Hope Creek Generating Station and Salem Nuclear Generating Station, Unit Nos. 1 and 2 - Issuance of Amendment NOS. 236, 349, and 331 RE: Modify Exclusion Area Boundary (ADAMS Accession No. ML24145A177)
- VTD 433691, Sheet 002 – MES Updated Annual Average X/Q and D/Q Values at the Revised Site Boundary and EAB Locations Salem and Hope Creek Nuclear Generating Stations
- Salem UFSAR Change S-23-004

Calculation factor updates include:

- Site Area Boundary Distance for Salem = 0.79 miles
- Salem Minimum Exclusion Area (MEA) boundary = 0.48 miles
- Exclusion Area Boundary (EAB) – for Salem Unit 1 and Unit 2 = 0.48 miles NNE
- Salem ODCM Site Boundary X/Q Value =  $1.31E-06$  sec/m<sup>3</sup>
- Salem EAB X/Q Value =  $1.80E-06$  sec/m<sup>3</sup>
- Site Specific Dose Rate Conversion Factor (DRCF) for U1 and U2 Value =  $5.03E+02$  mrem/year per uCi/ m<sup>3</sup>
- Single Unit ODCM Release Rate (Thyroid/I-131) = 17.7 uCi/sec
- Definitions have been updated to align with Emergency Plan Section 1 changes, as described in 5054(q) evaluation 2024-09
- Exclusion Area Boundary (EAB) has replaced Site Boundary where applicable in descriptions and calculations.

The resulting changes to the EAL Rad Setpoint Calculations are captured in the table below:

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 10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 2 of 4  
 Revision 0

**50.54Q I.D. Number:** 2024-38

**50.54Q Title:** EP-SA-325-237, Rev. 2, Attachment 6 – Salem EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

Type	Release Point	EAL	Rev. 1	Rev. 2
Gas	Plant Vent Effluent Noble Gas (U1+U2)	RU1.1	4.84E+05 µCi/sec	7.59E+05 µCi/sec
Gas	Plant Vent Effluent Noble Gas (U1+U2)	RA1.1	8.48E+07 µCi/sec	9.68E+07 µCi/sec
Gas	Plant Vent Effluent Noble Gas (U1+U2)	RS1.1	8.48E+08 µCi/sec	9.68E+08 µCi/sec
Gas	Plant Vent Effluent Noble Gas (U1+U2)	RG1.1	8.48E+09 µCi/sec	9.68E+09 µCi/sec
Liquid	Non-Rad Liquid Waste	RU1.1	3.60E+03 cpm	6.00E+3 cpm
Gas	Plant Vent NG	RU1.2	6.40E-03 µCi/cc	1.01E-02 µCi/sec
Gas	Plant Vent I-131	RU1.2	5.60E-07 µCi/cc	9.38E-07 µCi/cc

**Description of why the change is editorial (if not editorial, N/A this block):**

N/A

**Description of the licensing basis affected by the change to the Emergency Plan/Procedure (if not affected, omit this element):**

License Amendment (Accession No. ML24145A177) and associated LAR S23-04 and LAR H23-02, *Request to Modify the Salem and Hope Creek Exclusion Area Boundary*, changed the licensing basis as described in the Salem and Hope Creek Updated Final Safety Analysis Reports (UFSARs) to account for modifications to the Exclusion Area Boundary (EAB) for Salem and Hope Creek. Land parcels designated for use by the New Jersey Wind Port (NJWP) project were removed from the exclusion area. NRC approval was granted for those analyses for which the increase in consequences is more than minimal or that result in a departure from a method of evaluation described in the UFSAR, in accordance with 10 CFR 50.59(c)(2). Updated dose consequences for all analyses remain within the limits of 10 CFR 50.67.

The Emergency Plan was revised to implement the changes described above. Affected sections and associated 50.54q include:

Emergency Plan Section	50.54q
Section 1.0	2024-09
Section 2.0	2024-19
Section 6.0	2024-18
Section 7.0	2024-36
Section 11.0	2024-37
Section 15.0	2024-15

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**10CFR50.54(q) SUMMARY ANALYSIS REPORT**  
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Revision 0

**50.54Q I.D. Number:** 2024-38

**50.54Q Title:** EP-SA-325-237, Rev. 2, Attachment 6 – Salem EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

For the evaluation of the EAL Rad Set Point Calculations, the following Emergency plan sections were reviewed:

- Section 1 Definitions
- Section 5 Emergency Classification System

The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The emergency plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values.

The proposed change, revision of the EAL Rad Set Point Calculations, does not change the EAL scheme as described in the emergency plan and therefore does not result in changes to the PSEG Emergency Plan.

**A description of how the change to the Emergency Plan/Procedures still complies with regulation:**

10CFR50 Appendix E requires the following:

**Assessment Actions**

- IV.B.1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring.
- IV.B.2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.

The EAL threshold values have been recalculated to incorporate new factors determined by the approved changes to the exclusion area boundary. The threshold calculations used for this change are identical to those used to determine the threshold values in previous revisions of the EAL Rad Set Point Calculations and remain unchanged. The threshold values, while different from the previous values, remain consistent with the EAL scheme and reflect the reduction in the EAB. These factors and their source documents are listed in the change summary in Part I of this evaluation.

The proposed changes to the PSEG Emergency Action Levels do not change the EAL scheme, nor the basis for the individual EALs. The updated values resulting from implementation of Amendment Nos.

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**10CFR50.54(q) SUMMARY ANALYSIS REPORT**  
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50.54Q I.D. Number: 2024-38

50.54Q Title: EP-SA-325-237, Rev. 2, Attachment 6 – Salem EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

236, 349, and 331, maintain the EAL scheme as implemented, based on NEI 99-01, Rev. 6. The proposed change does not result in a reduction in effectiveness of the EALs.

**A description of why the proposed change was not a reduction in the effectiveness of the Emergency Plan/Procedure:**

The proposed revision to the PSEG Rad EAL Set Point Calcs and associated emergency action levels implements License Amendment ML24145A177 and does not change the classification and action level scheme as described in the emergency plan, or in 10 CRF 50.47. The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The emergency plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values. The proposed change does not change the EAL scheme as described in the emergency plan. No additional impact was identified on the PSEG emergency plan, and the change does not contradict any regulations or regulatory guidance. Therefore, the change does not result in a reduction in effectiveness of the PSEG emergency plan or emergency action levels.

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**ENCLOSURE 2**

**EP-SA-325-237, Rev. 2 - Attachment 6 – Salem EAL Rad Set-Point Calculation Document**

**(20 Total Pages)**

## Attachment 6 – Salem EAL Rad Set-Point Calculation Document

### Purpose:

This is a reference document that contains the methodology and calculations used in developing the thresholds for radiological release-based Emergency Action Levels (EALs). The radiological EALs covered under this document are based on EALs AU1, AA1, AS1 and AG1 in NEI-99-01, Rev. 06, "Development of Emergency Action Levels for Non-Passive Reactors".

### Reference Materials:

1. NEI 99-01, Rev. 06 - Development of Emergency Action Levels for Non-Passive Reactors
2. Salem ODCM Rev. 30
3. EPA 400-R-92-001, Manual for Protective Action Guides and Protective Actions for Nuclear Incidents
4. License Amendment Request to Modify the Salem and Hope Creek Exclusion Area Boundary, LAR S23-04
5. License Amendment Hope Creek Generating Station and Salem Nuclear Generating Station, Unit Nos. 1 and 2 - Issuance of Amendment NOS. 236, 349, and 331 RE: Modify Exclusion Area Boundary (ADAMS Accession No. ML24145A177)
6. VTD 433691, Sheet 002 - MES Updated Annual Average X/Q and D/Q Values at the Revised Site Boundary and EAB Locations Salem and Hope Creek Nuclear Generating Stations
7. Salem UFSAR Change S-23-004

### Terms & Calculation Constants and Origin:

- ODCM – Offsite Dose Calculation Manual
- Hours in one year: 365.25 days X 24 hrs/day = 8766 hours
- EDE – Effective Dose Equivalent
- CDE - Committed Dose Equivalent
- CEDE - Committed Effective Dose Equivalent = CDE X Weighting Factor (thyroid per 10 CFR20)
- TEDE – Total Effective Dose Equivalent = EDE + CEDE
- PAG – Protective Action Guideline: Per EPA = 1000mRem TEDE dose or 5000 mRem thyroid dose. Actual or projected values above these guidelines will require offsite protective actions to be implemented.
- ODCM Rad Effluent Limit – 500 mRem/year is a total site Noble Gas limit that includes Salem Unit 1, Salem Unit 2 and Hope Creek. Therefore, Salem will have an administratively controlled limit of 1/2 the total site limit or **250 mRem/year** for the **Unusual Event** EAL calculation purposes. (Reference: ODCM Rev 30 – Section 2.3.1 Boundary Dose Rate – Nobel Gas, page 58)

- Allocation Factor (AF) = 0.5 (0.25/unit) – As defined in the Salem ODCM Rev 30, table 2-2.1 & 2-2.2, this is an administrative control imposed to ensure that the combined releases from Salem Units 1 and 2 and Hope Creek will not exceed the regulatory limit from the site. The Site AF is only used in the UE EALs.
- Site Boundary Distance (minimum) = Salem @ 0.79 miles - References 4 & 5 above
- Minimum Exclusion Area (MEA) boundary = Salem @ 0.48 miles NNE
- X/Q = Annual Realistic Site Specific Atmospheric dispersion to the site boundary and to the Exclusion Area boundary (EAB).
  - Salem ODCM Site Boundary X/Q Value for UE = 1.31E-06 sec/m<sup>3</sup>.  
(Reference Salem ODCM Rev 30 Table 2-2.1 for Unit 1 and Table 2-2.2 for Unit 2 and Salem UFSAR Change S-23-004 Table 2.3-21)
  - Salem EAB X/Q Value (for Alert, SAE and GE) = 1.80E-06 sec/m<sup>3</sup>.  
(Reference: VTD 433691)
- DRCF = Site Specific Dose Rate Conversion Factor. U1 and U2 Value = 5.03E+02 mrem/year per uCi/ m<sup>3</sup>.  
(Reference: Salem ODCM, Rev. 30, Table C-1, Effective Dose Factors, Noble Gases – Total Body and Skin – Total Body Effective Dose Factor.)

**Index:** (Radiological Release EAL Calculations)

**Salem EALS:** (NEI 99-01, revision 6 equivalent EAL)

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**Calculation for: Unusual Event EAL RU1.1 – (Default Release Rate EAL)****Objective of Calculation:**

Provide a Salem Radiological Release Rate value that equates to a Release that is >2 times the ODCM limit of 500 mRem/year.

**Discussion:**

- The ODCM limit of 500 mRem/year is a total site limit that includes Salem 1, Salem 2 and Hope Creek. Therefore, Salem 1 & 2 will have an administratively controlled limit of ½ the total site limit or 250 mRem/year for EAL calculation purposes.
- This EAL does not include Iodine Release Rates since the Plant Vent does not have an Iodine detector.
- Release Rate = Total Noble Gas Release Rate from Salem (Unit 1 & Unit 2) which would result in a TEDE Dose Rate of 250 mRem/year. The EAL value will be 2 times this release rate.
- The ODCM value for X/Q at the site boundary (0.79 miles N) is 1.31E-06 as found in HC ODCM Rev. 30 Table 2-2.1 for Unit 1 and Table 2-2.2 for Unit 2.

**Derivation / Calculation:**

Radiological ODCM Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{\text{ODCM Limit} \left( \frac{\text{mRem}}{\text{year}} \right) * (\text{Site Allocation Factor})}{\left( \text{ODCM} \frac{\text{X}}{\text{Q}} \right) * (\text{ODCM DRCF})}$$

ODCM Limit = 500 mRem/Year

Salem ODCM X/Q (site boundary) = 1.310E-06 sec/m<sup>3</sup>

Salem ODCM DRCF = 5.03+02 mRem/yr/uCi/m<sup>3</sup>

Site Allocation Factor = 5.00E-01

$$\text{Release Rate uCi/Sec} = \frac{500 \text{ mrem/yr} * 0.5}{(1.31\text{E}-06 \text{ sec/m}^3) * (5.03\text{E}+02 \text{ mRem/yr/uCi/m}^3)}$$

$$\text{Release Rate uCi/Sec} = \frac{(500 \text{ mrem/yr}) * 0.5}{(1.31\text{E}-06 \text{ sec/m}^3) * (5.03\text{E}+2 \text{ mRem/yr)/uCi/m}^3} = 3.79\text{E}+05 \text{ uCi/Sec}$$

Release Rate = 3.79E+05 uCi/Sec

EAL Value = 2 times the Release Rate

**UE EAL Value: (EAL # RU1.1)**

**Total (S1 & S2) Noble Gas Release Rate >7.59E+05 μCi/sec**

**Calculation for: UNUSUAL EVENT EAL RU1.2 – (Sample Analysis Concentration)****Objective of Calculation:**

Provide a Radiological Release Noble Gas and Iodine Sample Concentration that equates to a Release that is >2 times the ODCM limit of 500 mRem/year.

**Discussion:**

The ODCM limit of 500 mRem/year (Noble Gas/Total Body) and 1500mRem/year (I-131/Child Thyroid) is a total site limit that includes Salem 1, Salem 2 and Hope Creek. Therefore, Salem 1&2 will have an administratively controlled limit (allocation factor) of ½ the total site limit or 250 mRem/year (Noble Gas/Total Body) and 750 mRem/year (I-131/Child Thyroid) for EAL calculation purposes. This allocation factor is used in the calculation that derived the Noble Gas and Iodine release rates.

**Derivation / Calculation:**

Calculation of the threshold sample concentrations are as follows:

$$\text{Formula: Concentration (uCi/cc)} = \frac{\text{Single Unit Release Rate} * 2}{\text{Conversion Factor} * \text{Vent Flow Rate}}$$

$$\text{Noble Gas Sample Concentration} = \frac{1.90\text{E}+05 \text{ uCi/Sec} * 2}{472 * 80000 \text{ cfm}} = \mathbf{1.01\text{E}-02 \text{ uCi/cc}}$$

$$\text{I-131 Sample Concentration} = \frac{(1.77\text{E}+01 \text{ uCi/Sec}) * 2}{472 * 80000 \text{ cfm}} = \mathbf{9.38\text{E}-07 \text{ }\mu\text{Ci/cc}}$$

Where:

- Single Unit (U1 or U2) Release Rate (Noble Gas) = Total Noble Gas Release Rate from Salem (Unit 1 & Unit 2) as derived for EAL RU1.1 split between Unit 1 and 2 (divided by 2) = 3.79E+05 uCi/Sec/2 = 1.90E+05 uCi/Sec per Unit.
- Single Unit (U1 or U2) Release Rate (Thyroid/I-131) = 17.7 μCi/Sec per unit as per ODCM, Rev. 30, Table 2-2.1 and 2-2.2.
- 2 = EAL criteria of 2X ODCM value
- 472 = conversion factor (28,317 cc/ft<sup>3</sup> x 1 min/60 sec)
- 80000 cfm = Plant Vent Flow (normal)

**UE EAL Values: (EAL# RU1.2)**

**Noble Gas Sample Concentration >1.01E-02 μCi/cc**

**I-131 Sample Concentration >9.38E-07 μCi/cc**

**Calculation for: ALERT EAL RA1.1 – (Default Release Rate EAL)****Objective of Calculation:**

Provide a Radiological Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.

**Discussion:**

This EAL does not include Iodine Release Rates since the Plant Vent does not have an Iodine detector.

Release Rate = Total Noble Gas Release Rate from Salem (Unit 1 & Unit 2) which would result in a TEDE Dose Rate of 10 mRem.

**Derivation / Calculation:**

MEA Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{(1\% \text{ of PAG})\text{mRem (accumulated in 1 hour)}}{(\text{EAB X/Q}) * (\text{ODCM DRCF})}$$

1% of PAG = 10 mRem/hr dose accumulated in 1 hour

Salem EAB X/Q = 1.80E-06 sec/m<sup>3</sup>

Salem ODCM DRCF = 5.74E-02 mRem/hr/uCi/m<sup>3</sup> <=(5.03E+02 mrem/year/uCi/m<sup>3</sup> / 8766 hrs/yr)

Site Allocation Factor = not used for ALERT, SAE and GE EALs

$$\text{Noble Gas Release Rate (uCi/Sec)} = \frac{10 \text{ mRem (dose accumulated in 1 hour)}}{(1.80\text{E-}06 \text{ sec/m}^3) * (5.74 \text{ E-}02 \text{ mRem/hr/uCi/m}^3)} = 9.68\text{E+}07 \text{ uCi/sec}$$

**Alert EAL Value: (EAL# RA1.1)**

**Total (S1 & S2) Noble Gas Release Rate > 9.68E+07 μCi/sec**

**Calculation for: ALERT - EAL RA1.2 – (Dose Assessment)****Objective of Calculation:**

Using actual meteorology, provide a dose assessment SSCL threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >10 mRem and a Thyroid-CDE Dose of 50 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 1% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the MINIMUM EXCLUSION AREA (MEA) satisfies this ALERT EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because ODCM default Meteorological data is used.

**Alert EALs Values: (EAL# RA1.2)****Dose Assessment TEDE Dose >10 mRem****Dose Assessment CDE Dose >50 mRem**

(These values are based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio.)

**Calculation for: ALERT - EAL RA1.3 – (Field Survey Dose Rate)****Objective of Calculation:**

Provide a **field survey** dose rate that equates to an offsite dose of >10 mRem/hr - closed window.

**Discussion:**

This IC addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer at or beyond the PROTECTED AREA boundary. This value exceeds 1% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant.

**Derivation / Calculation:**

A Field Measured Dose Rate of **>1.0E+01 mRem/hr** corresponds directly to a dose value that exceeds 1% of the EPA Protective Action Guidelines (PAGS).

**Alert EAL Value: (EAL# RA1.3)**

**Closed Window Dose Rate >10 mRem/hr**

**Calculation for: ALERT EAL RA1.3 – (Field Survey Iodine)****Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of > 50 mRem Thyroid CDE at or beyond the PROTECTED AREA boundary.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 50 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds 1% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of > 50 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of  $\mu\text{Ci/cc}$  for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci/cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci/cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci/cc}) = \frac{50 \text{ mRem/hr}}{1.30 \text{ E}+09 \text{ mRem/ } \mu\text{Ci /cc/hr}} = 3.85\text{E-}08 \mu\text{Ci/cc}$$

Where  $1.30\text{E}+09 \text{ mRem}/\mu\text{Ci/cc/hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}07 \text{ } \mu\text{Ci/cc})(2.00\text{E-}03 \text{ CCPM/DPM})(0.9)(2.22\text{E+}06 \text{ DPM}/\mu\text{Ci})(10 \text{ ft}^3)(2.832\text{E+}04 \text{ cc/ft}^3) = \mathbf{4.36\text{E+}01 \text{ CCPM}}$$

**\*\*\* Rounded to 4.50E+01 CCPM** (for ease of reading value on RM-14 or E-140 instrument)

Where:

<i>CCPM</i>	=	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM = Gross CPM – Bkg CPM</i>
<i>2.00E-03</i>	=	<i>Detector Efficiency - CCPM/DPM</i>
<i>0.9 (or 90%)</i>	=	<i>Collection Efficiency</i>
<i>2.22E+06</i>	=	<i>Conversion factor - DPM/<math>\mu</math>Ci</i>
<i>10 ft<sup>3</sup></i>	=	<i>Volume</i>
<i>2.832E+04</i>	=	<i>Conversion factor - cc to ft<sup>3</sup></i>

### **Alert EAL Values: (EAL# RA1.3)**

**I-131 Concentration >3.85E-08  $\mu$ Ci/cc**

**HP 260 Probe Reading >45 CCPM**

**Calculation for: SITE AREA EMERGENCY - EAL RS1.1 – (Default Release Rate EAL)****Objective of Calculation:**

Provide a Radiological Release Rate value that equates to a Release resulting in an offsite dose of >100 mRem EDE at or beyond the MEA.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on a site specific boundary (or beyond) dose of >100 mrem whole body. Iodine Release Rates for this EAL are excluded since the Plant Vent Radiation Monitoring System does not include an Iodine detector.

The meteorology and source term used are the same as used for determining RU1 and RA1 monitor reading EALs.

Release Rate = Total Noble Gas Release Rate from Salem (Unit 1 & Unit 2) which would result in a EDE Dose Rate of >100 mRem/hr at the MEA or beyond.

**Derivation / Calculation:**

MEA Limit Calculation for Noble Gas:

$$\text{Release Rate } (\mu\text{Ci/Sec}) = \frac{(10\% \text{ of PAG}) \text{ mRem (accumulated in 1 hour)}}{(\text{EAB X/Q}) * (\text{ODCM DRCF})}$$

10% of PAG = 100 mRem dose accumulated in 1 hour

Salem EAB X/Q = 1.80E-06 sec/m<sup>3</sup>

Salem ODCM DRCF = 5.74E-02 mRem/hr/uCi/m<sup>3</sup> <= (5.03E+02 mRem/yr/uCi/m<sup>3</sup> / 8766 hrs/yr)

Site Allocation Factor = not used for SAE and GE EALs

$$\text{Release Rate } (\mu\text{Ci/Sec}) = \frac{100 \text{ mRem (dose accumulated in 1 hour)}}{(1.80\text{E-}06 \text{ sec/m}^3) * (5.74\text{E-}02 \text{ mRem/hr/uCi/m}^3)} = 9.68\text{E+}08 \text{ uCi/sec}$$

**SAE EAL Value: (EAL# RS1.1)**

**Total (S1 & S2) Noble Gas Release Rate > 9.68E+08 μCi/Sec**

**Calculation for: SITE AREA EMERGENCY - EAL RS1.2 – (Dose Assessment)****Objective of Calculation:**

Using actual meteorology, provide a dose assessment SSCL threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >100 mRem and a Thyroid-CDE Dose of 500 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the Minimum Exclusion Area (MEA) satisfies this SAE EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because ODCM default Meteorological data is used.

**SAE EALs Values: (EAL# RS1.2)****Dose Assessment TEDE 4-Day Dose >1.0E+02 mRem****Dose Assessment CDE Dose >5.0E+02 mRem**

(These values are based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio)

**Calculation for: SITE AREA EMERGENCY - EAL RS1.3 – (Field Survey Dose Rate)****Objective of Calculation:**

Provide a **Field Survey** dose rate that equates to an offsite dose of >100 mRem/hr - closed window.

**Discussion:**

This EAL addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer at or beyond the PROTECTED AREA boundary. This value exceeds 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

**Derivation / Calculation:**

A Field Measured Dose Rate of >100 mRem/hr corresponds directly to a dose values that exceed 10% of the EPA Protective Action Guidelines (PAGS).

**SAE EAL Value: (EAL# RS1.3)****Closed Window Dose Rate >100 mRem/hr**

**Calculation for: SITE AREA EMERGENCY - EAL RS1.3 – (Field Survey Iodine)****Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of >500 mRem Thyroid CDE at or beyond the PROTECTED AREA boundary.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 500 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of > 500 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of  $\mu\text{Ci/cc}$  for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci/cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci/cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci/cc}) = \left( \frac{500 \text{ mRem / hr}}{1.30 \text{E} + 09 \text{ mRem / } \mu\text{Ci / cc / hr}} \right) = 3.85\text{E-}07 \mu\text{Ci/cc}$$

Where 1.30E+09 mRem/ $\mu\text{Ci/cc/hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}07 \mu\text{Ci/cc})(2.00\text{E-}03 \text{CCPM/DPM})(0.9)(2.22\text{E+}06 \text{DPM}/\mu\text{Ci})(10 \text{ft}^3)(2.832\text{E+}04 \text{cc}/\text{ft}^3) = \mathbf{4.36\text{E+}02 \text{CCPM}}$$

**\*\*\* Rounded to: 4.50E+02 CCPM** (for ease of reading value on RM-14 or E-140 instrument)

Where:

<i>CCPM</i>	=	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM = Gross CPM – Bkg CPM</i>
<i>2.00E-03</i>	=	<i>Detector Efficiency - CCPM/DPM</i>
<i>0.9 (or 90%)</i>	=	<i>Collection Efficiency</i>
<i>2.22E+06</i>	=	<i>Conversion factor - DPM/<math>\mu</math>Ci</i>
<i>10 ft<sup>3</sup></i>	=	<i>Volume</i>
<i>2.832E+04</i>	=	<i>Conversion factor - cc to ft<sup>3</sup></i>

**SAE EAL Values: (EAL# RS1.3)**

**I-131 Concentration >3.85E-07  $\mu$ Ci/cc**

**HP 260 Probe Reading >450 CCPM**

**Calculation for: GENERAL EMERGENCY - EAL RG1.1 – (Default Release Rate EAL)****Objective of Calculation:**

Provide a Radiological Release Rate value that equates to a Release resulting in an offsite dose of >1000 mrem TEDE at or beyond the MEA.

**Discussion:**

This IC addresses radioactivity releases that result in doses at or beyond the MEA that exceed the EPA Protective Action Guidelines (PAGS). Public protective actions will be necessary. Releases of this magnitude will require implementation of protective actions for the public.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on a site specific MEA (or beyond) dose of > 1000 mrem whole body. Iodine Release Rates for this EAL are excluded since the Plant Vent Radiation Monitoring System does not include an Iodine detector.

The meteorology and source term used are the same as used for determining RU1 and RA1 monitor reading EALs.

Release Rate = Total Noble Gas Release Rate from Salem (Unit 1 & Unit 2) which would result in a TEDE Dose Rate of >1000 mRem/hr at the MEA or beyond.

**Derivation / Calculation:**

Radiological Effluent Technical Specifications/ODCM Limit Calculation for Noble Gas:

$$\text{Release Rate } (\mu\text{Ci/Sec}) = \frac{(100\% \text{ of PAG}) \text{ mRem (accumulated in 1 hour)}}{(\text{EAB X/Q}) * (\text{ODCM DRCF})}$$

100% of PAG = 1000 mRem accumulated in 1 hour

Salem EAB X/Q = 1.80E-06 sec/m<sup>3</sup>

Salem ODCM DRCF = 5.74E-02 mRem/hr/uCi/m<sup>3</sup> <= (5.03E+02 mRem/yr/uCi/m<sup>3</sup> / 8766 hrs/yr)

Site Allocation Factor = not used for SAE and GE EALs

$$\text{Release Rate } (\mu\text{Ci/Sec}) = \frac{1000 \text{ mRem (dose accumulated in 1 hour)}}{(1.80\text{E-}06 \text{ sec/m}^3) * (5.74 \text{ E-}02 \text{ mRem/hr/uCi/m}^3)} = 9.68\text{E+}09 \text{ uCi/sec}$$

**GE EAL Value: (EAL# RG1.1)**

**Total (S1 & S2) Noble Gas Release Rate > 9.68E+09 uCi/sec**

**Calculation for: GENERAL EMERGENCY - EAL RG1.2 – (Dose Assessment)****Objective of Calculation:**

Using actual meteorology, provide a dose assessment SSCL threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >1000 mRem and a Thyroid-CDE Dose of >5000 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed the EPA Protective Action Guidelines (PAGS). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and involve fuel damage.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the Minimum Exclusion Area (MEA) satisfies this GE EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because ODCM default Meteorological data is used.

**GE EAL Values: (EAL# RG1.2)****Dose Assessment TEDE 4-Day Dose >1.0E+03 mRem****Dose Assessment CDE Dose >5.0E+03 mRem**

*(These values are based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio)*

**Calculation for: GENERAL EMERGENCY - EAL RG1.3 – (Field Survey Dose Rate)****Objective of Calculation:**

Provide a Field Survey dose rate that equates to an offsite dose of >1000 mRem/hr - closed window.

**Discussion:**

This EAL addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer at or beyond the PROTECTED AREA boundary. This value exceeds 100% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude will require implementation of protective actions for the public.

**Derivation / Calculation:**

A Field Measured Dose Rate of >1000 mRem/hr corresponds directly to a dose value that exceeds the EPA Protective Action Guidelines (PAGS).

**GE EAL Value: (EAL# RG1.3)****Closed Window Dose Rate >1000 mRem/hr**

**Calculation for: GENERAL EMERGENCY - EAL RG1.3 – (Field Survey Iodine)****Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of >5000 mRem Thyroid CDE at or beyond the PROTECTED AREA boundary.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 5000 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds the EPA Protective Action Guidelines (PAGs). Releases of this magnitude will require implementation of protective actions for the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of > 5000 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of  $\mu\text{Ci/cc}$  for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci/cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci/cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci/cc}) = \left( \frac{5000 \text{ mRem/hr}}{1.30E+09 \text{ mRem}/\mu\text{Ci/cc/hr}} \right) = \mathbf{3.85E-06 \mu\text{Ci/cc}}$$

Where  $1.30E+09 \text{ mRem}/\mu\text{Ci/cc/hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}06 \mu\text{Ci/cc})(2.00\text{E-}03 \text{CCPM/DPM})(0.9)(2.22\text{E+}06 \text{DPM}/\mu\text{Ci})(10 \text{ft}^3)(2.832\text{E+}04 \text{cc/ft}^3) = \mathbf{4.36\text{E+}03 \text{CCPM}}$$

**Rounded to: 4.50E+03 CCPM (for ease of reading value on RM-14 or E-140 instrument)**

Where:

<i>CCPM</i>	=	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM = Gross CPM – Bkg CPM</i>
<i>2.00E-03</i>	=	<i>Detector Efficiency - CCPM/DPM</i>
<i>0.9 (or 90%)</i>	=	<i>Collection Efficiency</i>
<i>2.22E+06</i>	=	<i>Conversion factor - DPM/<math>\mu\text{Ci}</math></i>
<i>10 ft<sup>3</sup></i>	=	<i>Volume</i>
<i>2.832E+04</i>	=	<i>Conversion factor - cc to ft<sup>3</sup></i>

**GE EAL Values: (EAL# RG1.4)**

**I-131 Concentration >3.85E-06  $\mu\text{Ci/cc}$**

**HP 260 Probe Reading >4.50E+03 CCPM**

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LR-N25-0003

**ENCLOSURE 3**

**10 CFR 50.54(q) Summary Analysis Report 2024-39,  
EP-HC-235-236, Rev. 2 Attachment 6 – Hope Creek EAL Rad Set Point Calculation  
Document**

**(4 Total Pages)**

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 1 of 4  
Revision 0

**50.54Q I.D. Number:** 2024-39

**50.54Q Title:** EP-HC-325-236, Rev. 2, Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

**Description of the change made to the Emergency Plan/Procedures:**

The proposed change revises EAL Rad set point calculations based on changes to the Exclusion Area Boundary (EAB) as documented in License Amendment ML24145A177. This includes the following:

References updated to include:

- Hope Creek ODCM Rev. 30
- License Amendment Request for Exclusion Area Boundary change, LAR S23-04
- License Amendment Hope Creek Generating Station and Salem Nuclear Generating Station, Unit Nos. 1 and 2 - Issuance of Amendment NOS. 236, 349, and 331 RE: Modify Exclusion Area Boundary (ADAMS Accession No.ML24145A177)
- VTD 433691 - Updated Annual Average X/Q and D/Q Values at the Revised Site Boundary and EAB Locations Salem and Hope Creek Nuclear Generating Stations
- Hope Creek UFSAR Change H-23-002

Calculation factor updates include:

- Site Area Boundary Distance for Hope Creek = 0.56 miles
- Hope Creek Minimum Exclusion Area (MEA) boundary = 0.29 miles NE
- Exclusion Area Boundary (EAB) – for Hope Creek = 0.29 miles NNE
- Hope Creek ODCM Site Boundary X/Q Value = 2.30E-06 sec/m<sup>3</sup>
- Hope Creek EAB X/Q Value = 4.80E-06 sec/m<sup>3</sup>
- Site Specific Dose Rate Conversion Factor (DRCF) for U1 and U2 Value = 5.03E+02 mrem/year per uCi/ m<sup>3</sup>
- Single Unit ODCM Release Rate (Thyroid/I-131) = 17.7 uCi/sec
- Definitions have been updated to agree with Emergency Plan Section 1 changes as described in 5054(q) evaluation 2024-09
- Exclusion Area Boundary (EAB) has replaced Site Boundary where applicable in descriptions and calculations.

**ATTACHMENT 3  
 10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 2 of 4  
 Revision 0

**50.54Q I.D. Number:** 2024-39

**50.54Q Title:** EP-HC-325-236, Rev. 2, Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

The resulting changes to the EAL Rad Setpoint Calculations are captured in the table below:

Type	Release Point	EAL	Rev. 1	Rev. 2
Gas	(Total) Offsite Gas Rad Release	RU1.1	3.00E+04 μCi/sec	2.80E+04 μCi/sec
Gas	(Total) Offsite Gas Rad Release	RA1.1	5.25E+06 μCi/sec	2.34E+06 μCi/sec
Gas	(Total) Offsite Gas Rad Release	RS1.1	5.25E+07 μCi/sec	2.34E+07 μCi/sec
Gas	(Total) Offsite Gas Rad Release	RG1.1	5.25E+08 μCi/sec	2.34E+08 μCi/sec
Gas	FRVS Vent NG	RU1.2	7.10E-03 μCi/cc	6.60E-03 μCi/sec
Gas	FRVS I-131	RU1.2	8.20E-06 μCi/cc	9.46E-06 μCi/sec
Gas	North Plant Vent NG	RU1.2	1.52E-03 μCi/cc	1.40E-03 μCi/sec
Gas	North Plant Vent I-131	RU1.2	1.80E-06 μCi/cc	2.03E-06 μCi/sec
Gas	South Plant Vent NG	RU1.2	1.44E-04 μCi/cc	1.35E-04 μCi/sec
Gas	South Plant Vent I-131	RU1.2	1.68E-07 μCi/cc	1.93E-07 μCi/sec

**Description of why the change is editorial (if not editorial, N/A this block):**

N/A

**Description of the licensing basis affected by the change to the Emergency Plan/Procedure (if not affected, omit this element):**

License Amendment (Accession No. ML24145A177) and associated LAR S23-04 and LAR H23-02, *Request to Modify the Salem and Hope Creek Exclusion Area Boundary*, changed the licensing basis as described in the Salem and Hope Creek Updated Final Safety Analysis Reports (UFSARs) to account for modifications to the Exclusion Area Boundary (EAB) for Salem and Hope Creek. Land parcels designated for use by the New Jersey Wind Port (NJWP) project were removed from the exclusion area. NRC approval was granted for those analyses for which the increase in consequences is more than minimal or that result in a departure from a method of evaluation described in the UFSAR, in accordance with 10 CFR 50.59(c)(2). Updated dose consequences for all analyses remain within the limits of 10 CFR 50.67.

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 3 of 4  
Revision 0

**50.54Q I.D. Number:** 2024-39

**50.54Q Title:** EP-HC-325-236, Rev. 2, Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

The Emergency Plan was revised to implement the changes described above. Affected sections and associated 50.54q include:

<b>Emergency Plan Section</b>	<b>50.54q</b>
Section 1.0	2024-09
Section 2.0	2024-19
Section 6.0	2024-18
Section 7.0	2024-36
Section 11.0	2024-37
Section 15.0	2024-15

For the evaluation of the EAL Rad Set Point Calculations, the following Emergency plan sections were reviewed:

- Section 1 Definitions
- Section 5 Emergency Classification System

The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The emergency plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values.

The proposed change, revision of the EAL Rad Set Point Calculations, does not change the EAL scheme as described in the emergency plan and therefore does not result in changes to the PSEG Emergency Plan.

**A description of how the change to the Emergency Plan/Procedures still complies with regulation:**

10CFR50 Appendix E requires the following:

**Assessment Actions**

IV.B.1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring.

IV.B.2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 4 of 4  
Revision 0

**50.54Q I.D. Number:** 2024-39

**50.54Q Title:** EP-HC-325-236, Rev. 2, Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document

(Doc #, Rev. #, Name, If applicable)

change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.

The EAL threshold values have been recalculated to incorporate new factors determined by the approved changes to the exclusion area boundary. The threshold calculations used for this change are identical to those used to determine the threshold values in previous revisions of the EAL Rad Set Point Calculations and remain unchanged. The threshold values, while different from the previous values, remain consistent with the EAL scheme and reflect the reduction in the EAB. These factors and their source documents are listed in the change summary in Part I of this evaluation.

The proposed changes to the PSEG Emergency Action Levels do not change the EAL scheme, nor the basis for the individual EALs. The updated values resulting from implementation of Amendment Nos. 236, 349, and 331, maintain the EAL scheme as implemented, based on NEI 99-01, Rev. 6. The proposed change does not result in a reduction in effectiveness of the EALs.

**A description of why the proposed change was not a reduction in the effectiveness of the Emergency Plan/Procedure:**

The proposed revision to the PSEG Rad EAL Set Point Calcs and associated emergency action levels implements License Amendment ML24145A177 and does not change the classification and action level scheme as described in the emergency plan, or in 10 CRF 50.47. The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The emergency plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values. The proposed change does not change the EAL scheme as described in the emergency plan. No additional impact was identified on the PSEG emergency plan, and the change does not contradict any regulations or regulatory guidance. Therefore, the change does not result in a reduction in effectiveness of the PSEG emergency plan or emergency action levels.

LR-N25-0003

**ENCLOSURE 4**

**EP-HC-325-236, Rev. 2 - Attachment 6 – Hope Creek EAL Rad Set-Point Calculation  
Document**

**(20 Total Pages)**

## **Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document**

### **Purpose:**

This is a reference document that contains the methodology and calculations used in developing the thresholds for radiological release-based Emergency Action Levels (EALs). The radiological EALs covered under this document are based on EALs AU1, AA1, AS1 and AG1 in NEI-99-01, Rev. 06, "Development of Emergency Action Levels for Non-Passive Reactors."

### **Reference Materials:**

1. NEI 99-01, Rev. 06 - Development of Emergency Action Levels for Non-Passive Reactors
2. Hope Creek ODCM Rev. 30
3. EPA 400-R-92-001, Manual for Protective Action Guides and Protective Actions for Nuclear Incidents
4. License Amendment Request to Modify the Salem and Hope Creek Exclusion Area Boundary, LAR H23-02
5. License Amendment Hope Creek Generating Station and Salem Nuclear Generating Station, Unit Nos. 1 and 2 - Issuance of Amendment NOS. 236, 349, and 331 RE: Modify Exclusion Area Boundary (ADAMS Accession No. ML24145A177)
6. VTD 433691, Sheet 002 – MES Updated Annual Average X/Q and D/Q Values at the Revised Site Boundary and EAB Locations Salem and Hope Creek Nuclear Generating Stations
7. Hope Creek UFSAR Change H-23-002

### **Terms & Calculation Constants and Origin:**

- ODCM – Offsite Dose Calculation Manual
- Hours in one year: 365.25 days X 24 hrs/day = 8766 hours
- EDE – Effective Dose Equivalent
- CDE - Committed Dose Equivalent
- CEDE - Committed Effective Dose Equivalent = CDE X Weighting Factor (thyroid per 10 CFR 20)
- TEDE – Total Effective Dose Equivalent = EDE + CEDE
- FRVS – Filtration Recirculation Vent System
- NPV – North Plant Vent
- SPV – South Plant Vent
- HTV – Hardened Torus Vent
- PAG – Protective Action Guideline: Per EPA = 1000mRem TEDE dose or 5000 mRem thyroid dose. Actual or projected values above these guidelines will require offsite protective actions to be implemented.

- ODCM Rad Effluent Limit - 500 mRem/year is a total site Noble Gas limit that includes Salem 1, Salem 2 and Hope Creek. Therefore, Hope Creek will have an administratively controlled limit of ½ the total site limit or 250 mRem/year for UNUSUAL EVENT EAL calculation purposes.
- Allocation Factor (AF) = 0.5 – As defined in the Hope Creek ODCM, (Table 2-2) this is an administrative control imposed to ensure that the combined releases from Salem Units 1 and 2 and Hope Creek will not exceed the regulatory limit from the site. The Site AF is only used in the UE EALs.
- Site Boundary Distance (minimum) = Hope Creek @ 0.56 miles - References 4 & 5 above
- Minimum Exclusion Area (MEA) boundary = Hope Creek @ 0.29 miles - References 4 & 5 above
- X/Q = Annual Realistic Site Specific Atmospheric dispersion to the site boundary and to the Exclusion Area Boundary (EAB).
  - Hope Creek Site Boundary X/Q Value for UE = 2.30E-06 sec/m<sup>3</sup>. Origin – Reference 2 above.
  - Hope Creek EAB X/Q Value (for Alert, SAE, GE) = 4.80E-06 sec/m<sup>3</sup>. Origin – Reference 6 above.
- DRCF = Site Specific Dose Rate Conversion Factor. Hope Creek = 7.8E+03 mrem/year per uCi/m<sup>3</sup>. Origin – Hope Creek ODCM, Rev. 30, Table C-1, Effective Dose Factors, Noble Gases – Total Body and Skin – Total Body Effective Dose Factor.

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Calculation for: **Unusual Event EAL RU1.1 – (Default Release Rate EAL)**

**Objective of Calculation:**

Provide a Hope Creek Radiological Release Rate value that equates to a Release that is >2 times the ODCM limit of 500 mRem/year.

**Discussion:**

The ODCM limit of 500 mRem/year is a total site limit that includes Salem 1, Salem 2 and Hope Creek. Therefore, Hope Creek will have an administratively controlled limit of ½ the total site limit or 250 mRem/year for EAL calculation purposes.

This EAL does not include Iodine Release Rates, since the Hope Creek Effluent monitors (FRVS, NPV, SPV and HTV) do not have Iodine detectors.

Release Rate = Total Noble Gas Release Rate from Hope Creek (FRVS, NPV, SPV, HTV) which would result in a TEDE Dose Rate of 250 mRem/year. The EAL value will be 2 times the release rate.

**Derivation / Calculation:**

ODCM Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{\text{ODCM Limit} \left( \frac{\text{mRem}}{\text{year}} \right) * (\text{Site Allocation Factor})}{\left( \text{ODCM} \frac{\text{X}}{\text{Q}} \right) * (\text{ODCM DRCF})}$$

ODCM Limit = 500 mRem/Year

Hope Creek Site Boundary X/Q = 2.30E-06 sec/m<sup>3</sup>

Hope Creek ODCM DRCF = 7.80E+03 mRem/yr/uCi/m<sup>3</sup>

Site Allocation Factor = 5.00E-01

$$\text{Release Rate (uCi/Sec)} = \frac{500 \text{ mRem/yr} * (5.00E - 01)}{(2.30E - 06 \text{ sec/m}^3) * (7.80E + 03 \text{ mRem/yr} / \mu\text{Ci/m}^3)}$$

Release Rate = 1.40E+04 uCi/Sec

EAL Value = 2 times the Release Rate

**UE EAL Value: (EAL # RU1.1)**

**Total Hope Creek Noble Gas Release Rate >2.80E+04 μCi/sec**

Calculation for: **Unusual Event EAL RU1.2 – (Gaseous Sample Analysis)**

**Objective of Calculation:**

Provide a Radiological Release Noble Gas and Iodine Sample Concentration that equates to a Release that is >2 times the ODCM limit of 500 mRem/year.

**Discussion:**

The ODCM limits of 500 mRem/year (Noble Gas/Total Body) and 1500mRem/year (I-131/Child Thyroid) are total site limits that include Salem 1, Salem 2 and Hope Creek. Therefore, Hope Creek will have an administratively controlled limit (allocation factor) of ½ the total site limit or 250 mRem/year (Noble Gas/Total Body) and 750 mRem/year (I-131/Child Thyroid) for EAL calculation purposes. This allocation factor is used in the calculation that derived the NG and Iodine release rates.

Hope Creek has three release points for which sample concentration thresholds are needed.

- FRVS – Filtration Recirculation Vent System
- NPV – North Plant Vent
- SPV – South Plant Vent

**Derivation / Calculation:**

Calculation of the threshold sample concentrations are as follows:

$$\text{Formula: Concentration (uCi/cc)} = \frac{\text{ODCM ReleaseRate} * 2}{\text{ConversionFactor} * \text{VentFlowRate}}$$

$$\text{FRVS Noble Gas Sample Concentration} = \frac{1.40\text{E}+04 \text{ uCi/sec} * 2}{472 * 9000 \text{ cfm}} = 6.60\text{E}-03 \text{ }\mu\text{Ci/cc}$$

$$\text{FRVS I-131 Sample Concentration} = \frac{2.01\text{E}+01 \text{ uCi/sec} * 2}{472 * 9000 \text{ cfm}} = 9.46\text{E}-06 \text{ }\mu\text{Ci/cc}$$

$$\text{NPV Noble Gas Sample Concentration} = \frac{1.40\text{E}+04 \text{ uCi/sec} * 2}{472 * 4.19\text{E}+04 \text{ cfm}} = 1.40\text{E}-03 \text{ }\mu\text{Ci/cc}$$

$$\text{NPV I-131 Sample Concentration} = \frac{2.01\text{E}+01 \text{ uCi/sec} * 2}{472 * 4.19\text{E}+04 \text{ cfm}} = 2.03\text{E}-06 \text{ }\mu\text{Ci/cc}$$

$$\text{SPV Noble Gas Sample Concentration} = \frac{1.40\text{E}+04 \text{ uCi/sec} * 2}{472 * 4.40\text{E}+05 \text{ cfm}} = 1.35\text{E}-04 \text{ }\mu\text{Ci/cc}$$

$$SPV\ I-131 \quad Sample\ Concentration = \frac{2.01E+01\ \mu Ci/sec * 2}{472 * 4.40E+05\ cfm} = 1.93E-07\ \mu Ci/cc$$

Where:

- ODCM limit Release Rate of 1.40E+04  $\mu Ci/sec$  per calculation performed for EAL RU1.1.
- ODCM limit (Thyroid/I-131) Release Rate of 2.01E+01  $\mu Ci/Sec$  as per ODCM, Rev. 30, Table 2-2
- 2 = EAL criteria of 2X Tech Spec/ODCM value
- 472 = conversion factor (28,317 cc/ft<sup>3</sup> x 1 min./60 sec.)
- 9000 cfm = FRVS Vent Flow (maximum) (ODCM Table 2-2)
- 4.19E+04 cfm = NPV Vent Flow (maximum) (ODCM Table 2-2)
- 4.40E+05 cfm = SPV Vent Flow (maximum) (ODCM Table 2-2)

**UE EAL Values: (EAL# RU1.2)**

**FRVS Noble Gas Sample Concentration > 6.60E-03  $\mu Ci/cc$**

**FRVS I-131 Sample Concentration > 9.46E-06  $\mu Ci/cc$**

**NPV Noble Gas Sample Concentration > 1.40E-03  $\mu Ci/cc$**

**NPV I-131 Sample Concentration > 2.03E-06  $\mu Ci/cc$**

**SPV Noble Gas Sample Concentration > 1.35E-04  $\mu Ci/cc$**

**SPV I-131 Sample Concentration > 1.93E-07  $\mu Ci/cc$**

Calculation for: **ALERT EAL RA1.1 – (Default Release Rate EAL)**

**Objective of Calculation:**

Provide a Radiological Release of gaseous radioactivity resulting in offsite dose greater than 10 mRem TEDE or 50 mRem thyroid CDE.

**Discussion:**

This EAL does not include Iodine Release Rates, since the Hope Creek Effluent monitors (FRVS, NPV, SPV and HTV) do not have Iodine detectors.

Release Rate = Total Noble Gas Release Rate from Hope Creek (FRVS, NPV, SPV, HTV) which would result in a TEDE Dose Rate of 10 mRem.

**Derivation / Calculation:**

MEA Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{(1\% \text{ of PAG}) \text{ mRem (accumulated in 1 hour)}}{(EAB X/Q) * (ODCM DRCF)}$$

1% of PAG = 1% of 1000 mRem or 10 mRem (dose accumulated in 1 hour)

Hope Creek EAB X/Q = 4.80 E-06 sec/m<sup>3</sup>

HC ODCM DRCF = 8.9 E-01 mRem/hr/uCi/m<sup>3</sup> = (7.80E+03 mRem/yr/uCi/m<sup>3</sup>/8766hrs/yr)

Site Allocation Factor = not used for Alert, SAE and GE EALs

$$\text{Release Rate Noble Gas (uCi/Sec)} = \frac{10 \text{ mRem (dose accumulated in 1 hour)}}{(4.80E-06 \text{ sec/m}^3) * (8.9E-01 \text{ mRem/hr/uCi/m}^3)} = 2.34E+06 \text{ uCi/sec}$$

**ALERT EAL Value: (EAL# RA1.1)**

**Total Hope Creek Noble Gas Release Rate > 2.34E+06 μCi/sec**

Calculation for: **ALERT EAL RA1.2 – (Dose Assessment)**

**Objective of Calculation:**

Using actual meteorology, provide a Station Status Checklist (SSCL) dose assessment threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >10 mRem and a Thyroid-CDE Dose of >50 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the EAB that exceed 1% of the EPA Protective Action Guidelines (PAGs). Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the MINIMUM EXCLUSION AREA (MEA) satisfies this ALERT EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because ODCM default Meteorological data is used.

**ALERT EAL Values: (EAL# RA1.2)**

**Dose Assessment TEDE Dose >10 mRem**

**Dose Assessment CDE Dose >50 mRem** – CDE Dose values are based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio

Calculation for: **ALERT - EAL RA1.3 – (Field Survey Dose Rate)**

**Objective of Calculation:**

Provide a Field Survey dose rate that equates to an offsite dose of >10 mRem/hr - closed window.

**Discussion:**

This EAL addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer at or beyond the PROTECTED AREA boundary. This value exceeds 1% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant.

**Derivation / Calculation:**

A Field Measured (closed window) Dose Rate of >10 mRem/hr corresponds directly to a dose value that exceeds 1% of the EPA Protective Action Guidelines (PAGS).

**ALERT EAL Value: (EAL# RA1.3)**

**Closed Window Dose Rate >10 mRem/hr**

Calculation for: **ALERT - EAL RA1.3 – (Field Survey Iodine)**

**Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of >50 mRem Thyroid CDE at or beyond the Protected Area Boundary for one hour of inhalation.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 50 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds 1% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of >50 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of uCi/cc for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci/cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci/cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci/cc}) = \frac{50 \text{ mRem/Hr}}{1.30\text{E}+09 \text{ m/Rem/uCi/cc/hr}} = 3.85\text{E-}08 \mu\text{Ci/cc}$$

Where 1.30E+09 mRem/ $\mu\text{Ci/cc/hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}08 \mu\text{Ci/cc}) (2.00\text{E-}03 \text{CCPM/DPM}) (0.9) (2.22\text{E+}06 \text{DPM}/\mu\text{Ci}) * (10 \text{ft}^3) (2.832\text{E+}04 \text{cc}/\text{ft}^3) = \mathbf{4.36\text{E+}01 \text{CCPM}}$$

**Rounded to: 45 CCPM (for ease of reading value on RM-14 or E-140 instrument)**

Where:

<i>CCPM</i> =	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM = Gross CPM – Bkg CPM</i>
<i>2.00E-03</i> =	<i>Detector Efficiency - CCPM/DPM</i>
<i>0.9 (or 90%)</i> =	<i>Collection Efficiency</i>
<i>2.22E+06</i> =	<i>Conversion factor - DPM/<math>\mu</math>Ci</i>
<i>10 ft<sup>3</sup></i> =	<i>Volume</i>
<i>2.832E+04</i> =	<i>Conversion factor - cc to ft<sup>3</sup></i>

**ALERT EAL Values: (EAL# RA1.3)**

**I-131 Concentration >3.85E-08  $\mu$ Ci/cc**

**HP 260 Probe Reading Value >45 CCPM**

Calculation for: **SITE AREA EMERGENCY - EAL RS1.1 – (Default Release Rate EAL)**

**Objective of Calculation:**

Provide a Radiological Release Rate value that equates to a Release resulting in an offsite dose of >100 mrem TEDE at or beyond the MEA.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on the EAB (or beyond) dose of 100 mrem whole body.

This EAL does not include Iodine release rates, since the Hope Creek effluent monitors (FRVS, NPV, SPV and HTV) do not have Iodine detectors.

The meteorology and source term used are the same as used for determining RU1 and RA1 monitor reading EALs.

Release Rate = Total Noble Gas Release Rate from Hope Creek which would result in a TEDE Dose Rate of >100mRem/hr at the MEA or beyond.

**Derivation / Calculation:**

MEA Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{(10\% \text{ of PAG}) \text{ mRem (accumulated in 1 hour)}}{(\text{EAB X/Q}) * (\text{ODCM DRCF})}$$

10% of PAG = 100 mRem/hr dose accumulated in 1 hour

Hope Creek EAB X/Q = 4.80E-06 sec/m<sup>3</sup>

HC ODCM DRCF = 8.9E-01 mRem/hr/uCi/m<sup>3</sup> = (7.80E+03 mRem/yr/uCi/ m<sup>3</sup> / 8766 hrs/yr)

Site Allocation Factor = not used for Alert, SAE and GE EALs

$$\text{Release Rate Noble Gas (uCi/Sec)} = \frac{100 \text{ mRem (dose accumulated in 1 hour)}}{(4.80E-06 \text{ sec/m}^3) * (8.9E-01 \text{ mRem/hr/uCi/m}^3)} = 2.34E+07 \text{ uCi/sec}$$

**SAE EAL Value: (EAL# RS1.1)**

**Total Hope Creek Noble Gas Release Rate >2.34E+07 uCi/Sec**

Calculation for: **SITE AREA EMERGENCY - EAL RS1.2 – (Dose Assessment)**

**Objective of Calculation:**

Using actual meteorology, provide a dose assessment SSCL threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >100 mRem and a Thyroid-CDE Dose of >500 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the MINIMUM EXCLUSION AREA (MEA) satisfies this SAE EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because default Meteorological data is used.

**SAE EALs Values: (EAL# RS1.2)**

**Dose Assessment TEDE 4-Day Dose >1.0E+02 mRem**

**Dose Assessment CDE Dose >5.00E+02 mRem** - based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio

Calculation for: **SITE AREA EMERGENCY - EAL RS1.3 – (Field Survey Dose Rate)**

**Objective of Calculation:**

Provide a Field Survey dose rate that equates to an offsite dose of >100 mRem/hr - closed window.

**Discussion:**

This EAL addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer at or beyond the PROTECTED AREA boundary. This value exceeds 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

**Derivation / Calculation:**

A Field Measured (closed window) Dose Rate of > 100 mRem/hr corresponds directly to a dose value that exceeds 10% of the EPA Protective Action Guidelines (PAGS).

**SAE EAL Value: (EAL# RS1.3)**

**Closed Window Dose Rate >100 mRem/hr**

Calculation for: **SITE AREA EMERGENCY - EAL RS1.3 – (Field Survey Iodine)**

**Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of >500 mRem Thyroid CDE at or beyond the PROTECTED AREA boundary.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 500 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds 10% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of >500 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of  $\mu\text{Ci}/\text{cc}$  for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci}/\text{cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci}/\text{cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci}/\text{cc}) = \left( \frac{500 \text{ mRem} / \text{hr}}{1.30 \text{E} + 09 \text{ mRem} / \mu\text{Ci} / \text{cc} / \text{hr}} \right) = \mathbf{3.85\text{E-}07 \mu\text{Ci}/\text{cc}}$$

Where 1.30E+09 mRem/ $\mu\text{Ci}/\text{cc}/\text{hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}07 \mu\text{Ci/cc}) (2.00\text{E-}03 \text{CCPM/DPM}) (0.9) (2.22\text{E+}06 \text{DPM}/\mu\text{Ci}) * (10 \text{ft}^3) (2.832\text{E+}04 \text{cc}/\text{ft}^3) = \mathbf{4.36\text{E+}02 \text{CCPM}}$$

**Rounded to: 4.50E+02 CCPM (for ease of reading value on RM-14 or E-140 instrument)**

Where:

$CCPM =$	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM = Gross CPM – Bkg CPM</i>
$2.00\text{E-}03 =$	<i>Detector Efficiency - CCPM/DPM</i>
$0.9 \text{ (or 90\%)} =$	<i>Collection Efficiency</i>
$2.22\text{E+}06 =$	<i>Conversion factor - DPM/<math>\mu\text{Ci}</math></i>
$10 \text{ft}^3 =$	<i>Volume</i>
$2.832\text{E+}04 =$	<i>Conversion factor - cc to <math>\text{ft}^3</math></i>

**SAE EAL Values: (EAL# RS1.3)**

**I-131 Concentration >3.85E-07  $\mu\text{Ci/cc}$**

**HP 260 Probe Reading >450 CCPM**

Calculation for: **GENERAL EMERGENCY - EAL RG1.1 – (Default Release Rate EAL)**

**Objective of Calculation:**

Provide a Radiological Release Rate value that equates to a Release resulting in an offsite dose of >1000 mRem TEDE at or beyond the MEA.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed the EPA Protective Action Guidelines (PAGS). Public protective actions will be necessary. Releases of this magnitude will require implementation of protective actions for the public.

The monitor reading EALs should be determined using a dose assessment method that back calculates from the dose values specified in the IC. Since doses are generally not monitored in real-time, it is suggested that a release duration of one hour be assumed, and that the EALs be based on EAB (or beyond) dose of >1000 mRem whole body.

This EAL does not include Iodine release rates, since the Hope Creek effluent monitors (FRVS, NPV, SPV and HTV) do not have Iodine detectors.

The meteorology and source term used are the same as used for determining RU1 and RA1 monitor reading EALs.

Release Rate = Total Noble Gas Release Rate from Hope Creek which would result in a TEDE Dose Rate of >1000 mRem/hr at the MEA or beyond.

**Derivation / Calculation:**

MEA Limit Calculation for Noble Gas:

$$\text{Release Rate (uCi/Sec)} = \frac{\text{(100\% of PAG) mRem (accumulated in 1 hour)}}{(\text{EAB X/Q}) * (\text{ODCM DRCF})}$$

100% of PAG = 1000 mRem/hr dose accumulated in 1 hour

Hope Creek EAB X/Q = 4.80E-06 sec/m<sup>3</sup>

HC ODCM DRCF = 8.9E-01 mRem/hr/uCi/m<sup>3</sup> (7.80E+03 mRem/yr/uCi/ m<sup>3</sup> / 8766 hrs/yr)

Site Allocation Factor = not used for SAE and GE EALs

$$\text{Release Rate Noble Gas (uCi/Sec)} = \frac{1000 \text{ mRem (dose accumulated in 1 hour)}}{(4.80E-06 \text{ sec/m}^3) * (8.9E-01 \text{ mRem/hr/uCi/m}^3)} = 2.34E+08 \text{ uCi/sec}$$

**GE EAL Value: (EAL# RG1.1)**

**Total Hope Creek Noble Gas Release Rate >2.34E+08 uCi/Sec**

Calculation for: **GENERAL EMERGENCY - EAL RG1.2 – (Dose Assessment)**

**Objective of Calculation:**

Using actual meteorology, provide a dose assessment SSCL threshold TEDE 4-Day Dose value that is equivalent to a TEDE dose of >1000 mRem and a Thyroid-CDE Dose of >5000 mRem.

**Discussion:**

This EAL addresses radioactivity releases that result in doses at or beyond the MEA that exceed 100% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude will require implementation of protective actions for the public.

**Derivation / Calculation:**

The dose assessment output on the SSCL is reported at varying distances from the plant as a TEDE 4-Day dose. Exceeding the EAL value at a distance at or beyond the Minimum Exclusion Area (MEA) satisfies this GE EAL threshold.

Dose Assessment using actual meteorological data provides an accurate indication of release magnitude. The use of dose assessment based EALs is therefore preferred over the use of Default Release Rate based EALs which utilize calculations which have built-in inaccuracies because ODCM default Meteorological data is used.

**GE EALs Values: (EAL# RG1.2)**

**Dose Assessment TEDE 4-Day Dose >1.0E+03 mRem**

**Dose Assessment CDE Dose >5.00E+03 mRem** - based on Dose Assessment as input to MIDAS and NOT based on a default Noble Gas to Iodine Ratio

Calculation for: **GENERAL EMERGENCY - EAL RG1.3 – (Field Survey Dose Rate)**

**Objective of Calculation:**

Provide a Field Survey dose rate that equates to an offsite dose of >1000 mRem/hr - closed window.

**Discussion:**

This EAL addresses radioactivity releases that result in field survey results (closed window) dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer at or beyond MEA. This value exceeds 100% of the EPA Protective Action Guidelines (PAGS). Releases of this magnitude will require implementation of protective actions for the public.

**Derivation / Calculation:**

A Field Measured (closed window) Dose Rate of >1000 mRem/hr corresponds directly to a dose value that exceed the EPA Protective Action Guidelines (PAGs).

**GE EAL Value: (EAL# RG1.3)**

**Closed Window Dose Rate >1000 mRem/hr**

Calculation for: **GENERAL EMERGENCY - EAL RG1.3 – (Field Survey Iodine)**

**Objective of Calculation:**

Provide a Field Survey Sample Analysis value that equates to an offsite release that would result in a dose of >5000 mRem Thyroid CDE at or beyond the PROTECTED AREA boundary.

**Discussion:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 5000 mRem for one hour of inhalation at or beyond the PROTECTED AREA boundary. This value exceeds the EPA Protective Action Guidelines (PAGS). Releases of this magnitude will require implementation of protective actions for the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of >5000 mRem/hr for I-131.

Field Survey I-131 Sample Analysis results are provided as both a sample concentration in units of  $\mu\text{Ci/cc}$  for field samples counted in a Multi-Channel-Analyzer (MCA) and as a count rate reading in units of Corrected Counts per Minute (CCPM) for field samples analysis obtained using a radiation count rate meter such as a RM-14 or E-140N with a HP260 probe attached.

**Derivation / Calculation:**

The release sample concentration calculations are as follows.

The sample concentration is calculated using the I-131 Dose Conversion Factor from EPA-400:

Solving the following equation for  $\mu\text{Ci/cc}$ :

$$\text{mRem/hr} = (\mu\text{Ci/cc})(\text{Dose Conversion Factor})$$

Then;

$$\text{I-131 Sample Concentration } (\mu\text{Ci/cc}) = \left( \frac{5000 \text{ mRem/hr}}{1.30 \text{E} + 09 \text{ mRem} / \mu\text{Ci/cc/hr}} \right) = \mathbf{3.85\text{E-}06 \mu\text{Ci/cc}}$$

Where  $1.30\text{E}+09 \text{ mRem}/\mu\text{Ci/cc/hr}$  is the Dose Conversion Factor from EPA-400, Table 5-4, Thyroid Dose, and includes the EPA breathing rate.

The Corrected Counts per Minute reading is calculated using the I-131 Sample concentration, and factors for using an RM-14 or E-140N with an HP260 probe.

Solving the following equation for CCPM:

$$\mu\text{Ci/cc} = \frac{\text{CCPM}}{(\text{Detector Efficiency})(\text{Collection Efficiency})(\text{Conversion Factor - DPM to } \mu\text{Ci})(\text{Volume - ft}^3)(\text{Conversion Factor - cc to ft}^3)}$$

Then;

$$\text{CCPM} = (3.85\text{E-}06 \mu\text{Ci/cc}) (2.00\text{E-}03 \text{CCPM/DPM}) (0.9) (2.22\text{E+}06 \text{DPM}/\mu\text{Ci}) * (10 \text{ft}^3) (2.832\text{E+}04 \text{cc}/\text{ft}^3) = \mathbf{4.36\text{E+}03 \text{CCPM}}$$

**Rounded to: 4.50E+03 CCPM (for ease of reading value on RM-14 or E-140 instrument)**

Where:

<i>CCPM</i> =	<i>Corrected Counts per Minute using an RM-14 or E-140N with an HP260 probe. CCPM – Gross CPM – BKG CPM</i>
<i>2.00E-03</i> =	<i>Detector Efficiency - CCPM/DPM</i>
<i>0.9 (or 90%)</i> =	<i>Collection Efficiency</i>
<i>2.22E+06</i> =	<i>Conversion factor - DPM/<math>\mu</math>Ci</i>
<i>10 ft<sup>3</sup></i> =	<i>Volume</i>
<i>2.832E+04</i> =	<i>Conversion factor - cc to ft<sup>3</sup></i>

**GE EAL Values: (EAL# RG1.3)**

**I-131 Concentration >3.85E-06  $\mu$ Ci/cc**

**HP 260 Probe Reading >4.50E+03 CCPM**

LR-N25-0003

**ENCLOSURE 5**

**10 CFR 50.54(q) Summary Analysis Report 2024-40,**

**Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):  
EP-SA-325-103, Rev. 2, Salem Section R – Abnormal Rad Levels/Rad Effluent  
EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)  
EP-SA-325-203, Rev. 2, Salem Abnormal Rad Levels/Rad Effluent**

**(5 Total Pages)**

**ATTACHMENT 3  
 10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page  1  of  5   
 Revision  0

**50.54Q I.D. Number:**  2024-40

**50.54Q Title:** **Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**  
**EP-SA-325-103, Rev. 2, Offsite Rad Conditions Flow Chart**  
**EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)**  
**EP-SA-325-203, Rev. 2, Offsite Rad Conditions Basis**

(Doc #, Rev. #, Name, If applicable)

**Description of the change made to the Emergency Plan/Procedures:**

License Amendment Request (LAR) S23-04, which requested a reduction of the Exclusion Area Boundary (EAB) for the PSEG Nuclear site, was approved by the NRC on 7/15/2024 (ADAMS Accession No. ML24145A177). This amendment is required to be implemented within 180 days, or by 1/11/2025. The Owner Controlled Area (OCA) will be reduced, and its boundary will coincide with the new EAB, with implementation of the LAR. The Protected Area (located within the OCA/EAB) will remain the same, as will the Site Boundary.

Due to the change in distance to the EAB, calculations in Attachment 6 – Salem Creek EAL Rad Set-Point Calculation Document (EP-SA-325-237) were required to be revised (reference 50.54(q) evaluation 2024-38). Emergency Plan definitions were also required to be updated to align the changes to the revised UFSAR (reference 50.54(q) evaluation 2024-09). The purpose of this 50.54(q) evaluation is to evaluate specific changes as listed below, to the Salem EALs and ECG documents, to implement the LAR.

Salem EAL changes are as follows, based on the revisions to Attachment 6. EAL RU1.1 is also being revised to correct a previous error that was identified during the reviews (notification 20983883).

<b>EAL</b>	<b>Current Value</b>	<b>Proposed Value</b>
<b>RU1.1</b>	> 4.85E+05 µCi/sec 1R41D + 2R41D <u>OR</u> SPDS combined release rate  3.60E+03 cpm on Non-Rad Liquid Waste Basin (2R37)	> 7.59E+05 µCi/sec 1R41D + 2R41D <u>OR</u> SPDS combined release rate  6.00E+03 cpm on Non-Rad Liquid Waste Basin (2R37)
<b>RU1.2</b>	> 6.40E-03 µCi/cc - Noble Gas Plant Vent Effluent Sample  5.60E-07 µCi/cc - I-131 Plant Vent Effluent Sample	> 1.01E-02 µCi/cc - Noble Gas Plant Vent Effluent Sample  9.38E-07 µCi/cc - I-131 Plant Vent Effluent Sample
<b>RA1.1</b>	> 8.48E+07 µCi/sec	> 9.68E+07 µCi/sec
<b>RS1.1</b>	> 8.48E+08 µCi/sec	> 9.68E+08 µCi/sec
<b>RG1.1</b>	> 8.48E+09 µCi/sec	> 9.68E+09 µCi/sec

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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**50.54Q I.D. Number:** 2024-40

**50.54Q Title:** **Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**  
**EP-SA-325-103, Rev. 2, Offsite Rad Conditions Flow Chart**  
**EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)**  
**EP-SA-325-203, Rev. 2, Offsite Rad Conditions Basis**

(Doc #, Rev. #, Name, If applicable)

Specific changes to Salem ECG procedures to implement the Emergency Plan and EAL changes, are listed below.

**EP-SA-325-103:**

- Updated value for 1R41D + 2R41D or SPDS combined release rate, for EAL RU1.1, due to changes in Attachment 6, EP-SA-325-237.
- Updated value for Non-Rad Liquid Waste Basin (2R37), for EAL RU1.1, due to previous error (notification 20983883).
- Updated values for Noble Gas Plant Vent Effluent Sample and I-131 Plant Vent Effluent Sample, for EAL RU1.2, due to changes in Attachment 6, EP-SA-325-237.
- Updated value for Plant Vent Effluent Offsite Gas Rad Release rate readings for EALs RA1.1, RS1.1, and RG1.1, due to changes in Attachment 6, EP-SA-325-237.

**EP-SA-325-140:**

- Updated Table R-1 Plant Vent Effluent Noble Gas Unit 1 + Unit 2 values for EALs RU1.1, RA1.1, RS1.1, and RG1.1, due to changes in Attachment 6, EP-SA-325-237.
- Updated Table R-1 value for Non-Rad Liquid Waste for EAL RU1.1, due to previous error (notification 20983883).
- Updated Table R-2 Plant Vent values for EAL RU1.2, due to changes in Attachment 6, EP-SA-325-237.

**EP-SA-325-203:**

- In Table R-1, for EALs RU1.1, RA1.1, RS1.1, and RG1.1:
  - Updated Plant Vent Effluent Noble Gas Unit 1 + Unit 2 values for GE, SAE, ALERT, and UE, due to changes in Attachment 6, EP-SA-325-237.
  - Corrected error for 2R37 setpoint for UE (reference notification 20983883).
- Updated Table R-2 values in EAL RU1.2, due to changes in Attachment 6, EP-SA-325-237.
- Updated definitions for MEA and OCA in EALs RA1.2, RA1.4, and RG1.2, due to changes to Emergency Plan Section 1.
- Updated definitions for OCA and PA in EALs RA1.3, RS1.3, and RG1.3, due to changes to Emergency Plan Section 1.
- For EALs RS1.1 and RG1.1, updated site boundary to MEA in the Explanation section and added updated MEA definition, due to changes to Emergency Plan Section 1.
- For EAL RS1.2, removed outdated explanation and updated definitions for MEA and OCA, due to changes to Emergency Plan Section 1.

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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Revision 0

**50.54Q I.D. Number:** 2024-40

**50.54Q Title:** **Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**  
**EP-SA-325-103, Rev. 2, Offsite Rad Conditions Flow Chart**  
**EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)**  
**EP-SA-325-203, Rev. 2, Offsite Rad Conditions Basis**

(Doc #, Rev. #, Name, If applicable)

**Description of why the change is editorial (if not editorial, N/A this block):**

N/A

**Description of the licensing basis affected by the change to the Emergency Plan/Procedure (if not affected, omit this element):**

Implementation of LAR S23-04 will update the licensing basis as described in the Salem and Hope Creek Updated Final Safety Analysis Reports (UFSARs), to account for modifications to the EAB for Salem and Hope Creek. Land parcels designated for use by the New Jersey Wind Port (NJWP) project were removed from the exclusion area. NRC approval was granted for those analyses for which the increase in consequences is more than minimal or that result in a departure from a method of evaluation described in the UFSAR, in accordance with 10 CFR 50.59(c)(2). Updated dose consequences for all analyses remain within the limits of 10 CFR 50.67.

The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The Emergency Plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values. The proposed change (revisions to values for EALs RU1.1, RU1.2, RA1.1, RS1.1, and RG1.1) does not change the EAL scheme as described in the Emergency Plan.

**A description of how the change to the Emergency Plan/Procedures still complies with regulation:**

Due to changes to the parameters in Attachment 6, Salem EAL values are changing as outlined below. The changes are due to new x/Q factors used, due to the distance to the EAB changing (moving closer, towards the reactor).

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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 Revision 0

**50.54Q I.D. Number:** 2024-40

**50.54Q Title:** Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):  
 EP-SA-325-103, Rev. 2, Offsite Rad Conditions Flow Chart  
 EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)  
 EP-SA-325-203, Rev. 2, Offsite Rad Conditions Basis

(Doc #, Rev. #, Name, If applicable)

<b>EAL</b>	<b>Current Value</b>	<b>Proposed Value</b>
<b>RU1.1</b>	> 4.85E+05 µCi/sec 1R41D + 2R41D <u>OR</u> SPDS combined release rate  3.60E+03 cpm on Non-Rad Liquid Waste Basin (2R37)	> 7.59E+05 µCi/sec 1R41D + 2R41D <u>OR</u> SPDS combined release rate  6.00E+03 cpm on Non-Rad Liquid Waste Basin (2R37)
<b>RU1.2</b>	> 6.40E-03 µCi/cc - Noble Gas Plant Vent Effluent Sample  5.60E-07 µCi/cc - I-131 Plant Vent Effluent Sample	> 1.01E-02 µCi/cc - Noble Gas Plant Vent Effluent Sample  9.38E-07 µCi/cc - I-131 Plant Vent Effluent Sample
<b>RA1.1</b>	> 8.48E+07 µCi/sec	> 9.68E+07 µCi/sec
<b>RS1.1</b>	> 8.48E+08 µCi/sec	> 9.68E+08 µCi/sec
<b>RG1.1</b>	> 8.48E+09 µCi/sec	> 9.68E+09 µCi/sec

10 CFR 50 Appendix E requires the following:

*Assessment Actions*

- 1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring.*
- 2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.*

The proposed changes to the PSEG Emergency Action Levels do not change the EAL scheme, nor the basis for the individual EALs. The updated values resulting from implementation of LAR S23-04 maintain the scheme as implemented and based on NEI 99-01, Rev. 6. The proposed change does not result in a reduction in effectiveness of the EALs or the PSEG Nuclear Emergency Plan. There were no EP Commitments found for these specific EAL values.

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**  
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**50.54Q I.D. Number:** 2024-40

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**50.54Q Title:** Salem Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):  
EP-SA-325-103, Rev. 2, Offsite Rad Conditions Flow Chart  
EP-SA-325-140, Rev. 2, Salem EAL Wall Chart (All Conditions)  
EP-SA-325-203, Rev. 2, Offsite Rad Conditions Basis

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(Doc #, Rev. #, Name, If applicable)

**A description of why the proposed change was not a reduction in the effectiveness of the Emergency Plan/Procedure:**

The proposed changes to Salem EALs and associated ECG documents implement LAR S23-04 and associated Emergency Plan changes. There are no EAL scheme changes associated with this change and the EAL values are not changing in order of magnitude. There is no reduction in effectiveness of the PSEG Nuclear Emergency Plan due to the proposed change.

LR-N25-0003

**ENCLOSURE 6**

**EP-SA-325-103, Rev. 2 - Salem Section R- Abnormal Rad Levels/Rad Effluent**

**(4 Total Pages)**

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

Initiating Condition

Release of gaseous or liquid radioactivity greater than 2 times the ODCM for 60 minutes or longer

MODE

All

**EAL #**

**E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
N  
  
L  
E  
V  
E  
L  
S**

Gaseous/  
Liquid Release  
Rate

**RU1.1**

**IF**

Reading on **ANY** effluent radiation monitor > thresholds below

- > **7.59E+05 µCi/sec** 1R41D + 2R41D **OR** SPDS combined release rate
- **1.64E+03 cpm** on Cont Fan Coil -1(2)R13A/B
- **U1= 5.50E+05 cpm**  
**U2= 9.90E+05 cpm**  
Liquid Release Disposal  
1(2)R18
- **U1= 6.40E+03 cpm**  
**U2= 2.10E+04 cpm**  
on SG Blowdown -1(2)R19A-D
- **6.00E+03 cpm** on Non-Rad Liquid Waste Basin (2R37)

(Note 3)

Gaseous/Liquid  
Sample Analysis

**RU1.2**

**IF**

Sample analysis for a gaseous or liquid release indicates a concentration or release rate > threshold below

- > **1.01E-02 µCi/cc** - Noble Gas Plant Vent Effluent Sample
- **9.38E-07 µCi/cc** - I-131 Plant Vent Effluent Sample
- **2 x ODCM 3/4.11.2** – for an Unmonitored Release Point
- **2 x ODCM 3/4.11.1**  
for **ANY** one of the below listed Release Points:
  - Containment Fan Coil
  - Liquid Release Disposal
  - Steam Generator Blowdown
  - Chemical Waste Basin
  - Unmonitored Release Point

**AND**

≥ **60 minutes** have elapsed  
(Notes 1, 2)

**THEN**

Refer to Attachment 1  
**UNUSUAL EVENT**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.  
Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.  
Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Action Required

**(Turn Page for ALERT EALs)**

**R1**

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

Initiating Condition

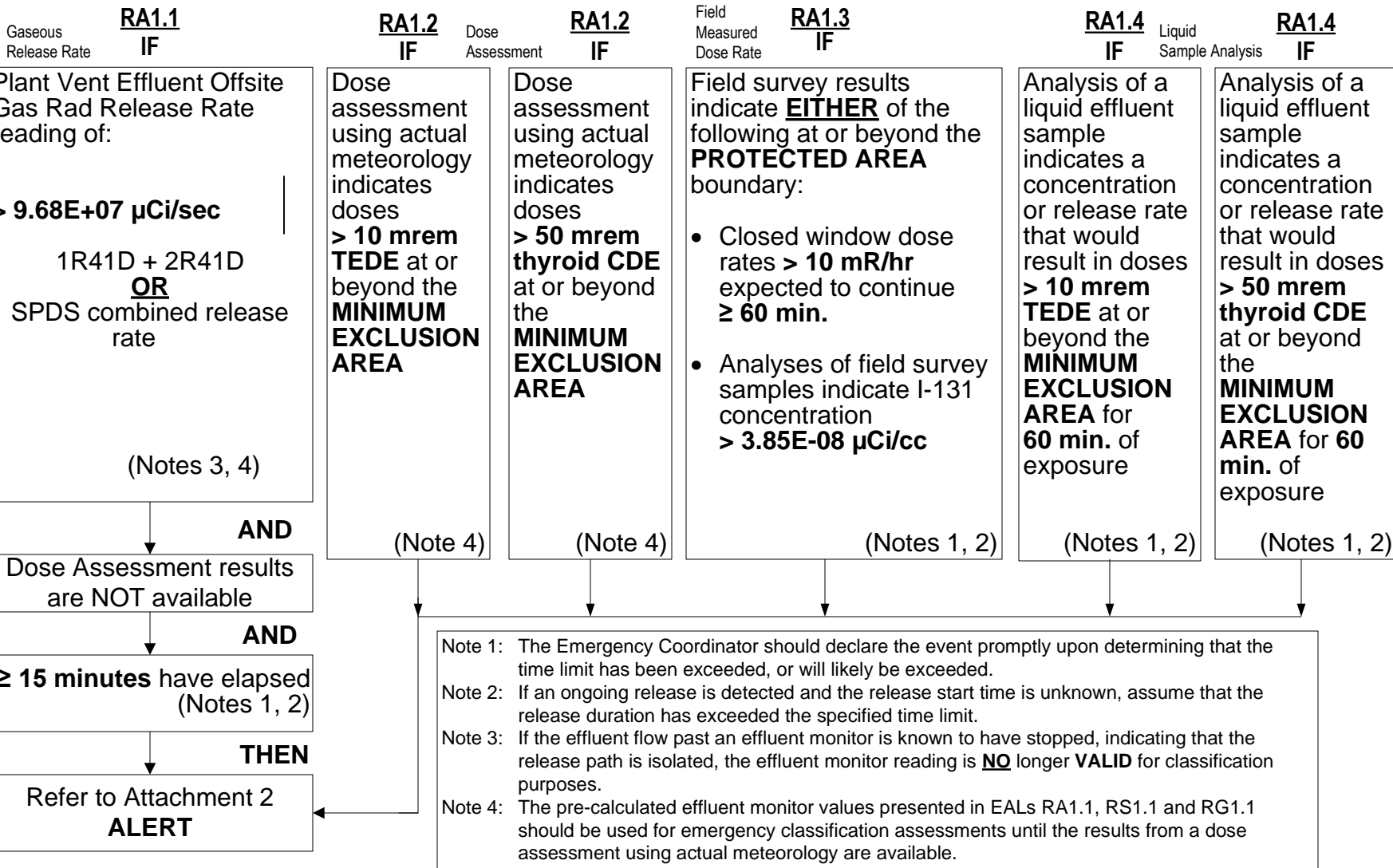
Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

MODE

All

**EAL #**

E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
N  
  
L  
E  
V  
E  
L  
S



# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

Initiating Condition

Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

MODE

All

**EAL #**

**RS1.1**  
IF

**RS1.2**  
IF

**RS1.2**  
IF

Field Measured Dose Rate  
**RS1.3**  
IF

E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
N  
  
L  
E  
V  
E  
L  
S

Release Rate

Plant Vent Effluent Offsite Gas Rad Release Rate reading of:  
**> 9.68E+08  $\mu$ Ci/sec**  
  
1R41D + 2R41D  
**OR**  
SPDS combined release rate  
  
(Notes 3, 4)

Dose Assessment

Dose assessment using actual meteorology indicates doses **> 100 mrem TEDE** at or beyond the **MINIMUM EXCLUSION AREA**  
  
(Note 4)

Dose assessment using actual meteorology indicates doses **> 500 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA**  
  
(Note 4)

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary:

- Closed window dose rates **> 100 mR/hr** expected to continue for  **$\geq 60$  min.**
- Analyses of field survey samples indicate I-131 concentration **> 3.85E-07  $\mu$ Ci/cc**

(Notes 1, 2)

**AND**

Dose Assessment results are NOT available

**AND**

**$\geq 15$  minutes have elapsed**  
(Notes 1, 2)

**THEN**

Refer to Attachment 3  
**SITE AREA EMERGENCY**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.  
Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.  
Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.  
Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Action Required

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

Initiating Condition

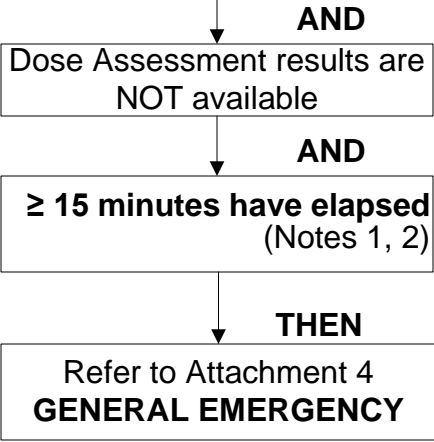
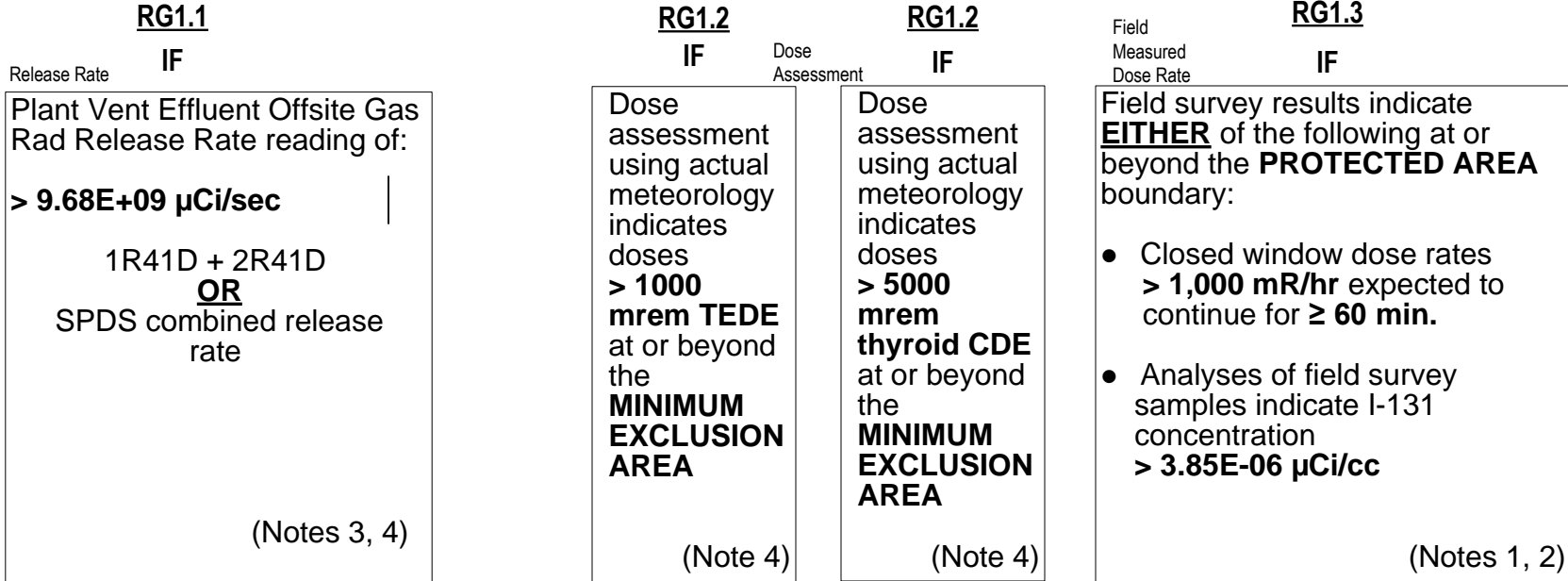
Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

MODE

All

**EAL #**

**E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
N  
  
L  
E  
V  
E  
L  
S**



Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Action Required

LR-N25-0003

**ENCLOSURE 7**

**EP-SA-325-140, Rev. 2 - Salem EAL Wall Chart (All Conditions)**

**(1 Total Page)**

		GENERAL EMERGENCY Implement Att. 4		SITE AREA EMERGENCY Implement Att. 3		ALERT Implement Att. 2		UNUSUAL EVENT Implement Att. 1 (Att. 24 for Common Site)																																																																											
R	1 Offsite Rad Conditions	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE <b>RG1.1</b> [ 1   2   3   4   5   6   DEF ] In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4) <b>RG1.2</b> [ 1   2   3   4   5   6   DEF ] Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 5,000 mrem thyroid CDE at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RG1.3</b> [ 1   2   3   4   5   6   DEF ] Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: ● Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. ● Analyses of field survey samples indicate I-131 concentration > 3.85E-06 μCi/cc (Notes 1, 2)	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE <b>RS1.1</b> [ 1   2   3   4   5   6   DEF ] In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4) <b>RS1.2</b> [ 1   2   3   4   5   6   DEF ] Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RS1.3</b> [ 1   2   3   4   5   6   DEF ] Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: ● Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. ● Analyses of field survey samples indicate I-131 concentration > 3.85E-07 μCi/cc (Notes 1, 2)	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE <b>RA1.1</b> [ 1   2   3   4   5   6   DEF ] In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4) <b>RA1.2</b> [ 1   2   3   4   5   6   DEF ] Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RA1.3</b> [ 1   2   3   4   5   6   DEF ] Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: ● Closed window dose rates > 10 mR/hr expected to continue ≥ 60 min. ● Analyses of field survey samples indicate I-131 concentration > 3.85E-08 μCi/cc (Notes 1, 2) <b>RA1.4</b> [ 1   2   3   4   5   6   DEF ] Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem thyroid CDE at or beyond the <b>MINIMUM EXCLUSION AREA</b> for 60 min. of exposure (Notes 1, 2)	Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer <b>RU1.1</b> [ 1   2   3   4   5   6   DEF ] Reading on <b>ANY Table R-1</b> effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3) <b>RU1.2</b> [ 1   2   3   4   5   6   DEF ] Sample analysis for a gaseous or liquid release indicates a concentration or release rate > <b>Table R-2</b> threshold for ≥ 60 min. (Notes 1, 2)																																																																														
	2 Abnormal Rad Levels / Rad Effluent	Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer <b>RG2.1</b> [ 1   2   3   4   5   6   DEF ] Spent fuel pool level <b>CANNOT</b> be restored to at least 105.5 ft. for ≥ 60 min. (Note 1)	Spent fuel pool level at the top of the fuel racks <b>RS2.1</b> [ 1   2   3   4   5   6   DEF ] Lowering of spent fuel pool level to 105.5 ft.	Significant lowering of water level above, or damage to, irradiated fuel <b>RA2.1</b> [ 1   2   3   4   5   6   DEF ] Uncovery of irradiated fuel in the <b>REFUELING PATHWAY</b> <b>RA2.2</b> [ 1   2   3   4   5   6   DEF ] Damage to irradiated fuel resulting in a release of radioactivity that causes a High alarm on <b>ANY</b> of the following radiation monitors: Fuel Handling Bldg ● 1(2)R5 Fuel Handling Bldg ● 1(2)R9 Fuel Storage Area ● 1(2)R32A Fuel Handling Crane Fuel Handling Bldg (local monitor) ● 1(2)R41A Plant Vent Containment ● 1(2)R2 Containment General Area 130 ft elevation ● 1(2)R11A Containment Air - Particulate ● 1(2)R12A Containment Vent - Noble Gas ● 1(2)R12B Containment Vent - Iodine <b>RA2.3</b> [ 1   2   3   4   5   6   DEF ] Lowering of spent fuel pool level to 115 ft.	<b>UNPLANNED</b> loss of water level above irradiated fuel <b>RU2.1</b> [ 1   2   3   4   5   6   DEF ] <b>UNPLANNED</b> water level drop in the <b>REFUELING PATHWAY</b> as indicated by <b>ANY</b> of the following: ● Confirmed SFP low level alarm (OHA-C35 SFP LVL LO) ● RVLIS - Refueling Mode ● Visual observation (local or remote) <b>AND</b> <b>UNPLANNED</b> rise in corresponding area radiation levels on <b>ANY</b> of the following: ● 1(2)R5 Fuel Handling Bldg ● 1(2)R9 Fuel Storage Area ● 1(2)R32A Fuel Handling Crane Fuel Handling Bldg (local monitor) ● 1(2)R2 Containment General Area 130 ft elevation ● Temporary ARMs on 130 ft elevation of the Containment or Fuel Handling Building																																																																														
	3 Area Radiation Levels	<table border="1"> <caption>Table R-1 Effluent Monitor Classification Thresholds *</caption> <thead> <tr> <th>Release Point</th> <th>Monitor</th> <th>GE</th> <th>SAE</th> <th>Alert</th> <th>UE</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Gaseous</td> <td>Plant Vent Effluent</td> <td>1R41D + 2R41D</td> <td rowspan="2">9.68E+09 μCi/sec</td> <td rowspan="2">9.68E+08 μCi/sec</td> <td rowspan="2">9.68E+07 μCi/sec</td> <td rowspan="2">7.59E+05 μCi/sec</td> </tr> <tr> <td>Noble Gas Unit 1 + Unit 2</td> <td>OR SPDS combined release rate</td> </tr> <tr> <td rowspan="4">Liquid</td> <td>Containment Fan Coil Process</td> <td>1(2)R13A/B</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>1.64E+03 cpm</td> </tr> <tr> <td>Liquid Radwaste Disposal Process</td> <td>1R18 2R18</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>U1= 5.50E+05 cpm U2= 9.90E+05 cpm</td> </tr> <tr> <td>Steam Generator Blowdown Process</td> <td>1R19A-D 2R19A-D</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>U1= 6.40E+03 cpm U2= 2.10E+04 cpm</td> </tr> <tr> <td>Non-Rad Liquid Waste</td> <td>2R37</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>6.00E+03 cpm</td> </tr> </tbody> </table>		Release Point	Monitor	GE	SAE	Alert	UE	Gaseous	Plant Vent Effluent	1R41D + 2R41D	9.68E+09 μCi/sec	9.68E+08 μCi/sec	9.68E+07 μCi/sec	7.59E+05 μCi/sec	Noble Gas Unit 1 + Unit 2	OR SPDS combined release rate	Liquid	Containment Fan Coil Process	1(2)R13A/B	-----	-----	-----	1.64E+03 cpm	Liquid Radwaste Disposal Process	1R18 2R18	-----	-----	-----	U1= 5.50E+05 cpm U2= 9.90E+05 cpm	Steam Generator Blowdown Process	1R19A-D 2R19A-D	-----	-----	-----	U1= 6.40E+03 cpm U2= 2.10E+04 cpm	Non-Rad Liquid Waste	2R37	-----	-----	-----	6.00E+03 cpm	<table border="1"> <caption>Table R-2 Effluent Sample Classification Thresholds</caption> <thead> <tr> <th>Release Point</th> <th>Sample</th> <th>Threshold</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Gaseous</td> <td>Plant Vent</td> <td>NG I-131</td> <td>1.01E-02 μCi/cc 9.38E-07 μCi/cc</td> </tr> <tr> <td>Unmonitored</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.2</td> </tr> <tr> <td rowspan="4">Liquid</td> <td>Containment Fan Coil</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.1</td> </tr> <tr> <td>Liquid Radwaste Disposal</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.1</td> </tr> <tr> <td>Steam Generator Blowdown</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.1</td> </tr> <tr> <td>Chemical Waste Basin</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.1</td> </tr> <tr> <td>Unmonitored</td> <td>Isotopic</td> <td>2 x ODCM 3/4.11.1</td> </tr> </tbody> </table>	Release Point	Sample	Threshold	Gaseous	Plant Vent	NG I-131	1.01E-02 μCi/cc 9.38E-07 μCi/cc	Unmonitored	Isotopic	2 x ODCM 3/4.11.2	Liquid	Containment Fan Coil	Isotopic	2 x ODCM 3/4.11.1	Liquid Radwaste Disposal	Isotopic	2 x ODCM 3/4.11.1	Steam Generator Blowdown	Isotopic	2 x ODCM 3/4.11.1	Chemical Waste Basin	Isotopic	2 x ODCM 3/4.11.1	Unmonitored	Isotopic	2 x ODCM 3/4.11.1	<table border="1"> <caption>Table R-3 Safe Operation &amp; Shutdown Rooms/Areas</caption> <thead> <tr> <th>Unit 1/2 Room/Area</th> <th>Mode Applicability</th> </tr> </thead> <tbody> <tr> <td>78' Electrical Penetration Area</td> <td>4</td> </tr> <tr> <td>64' Switchgear Room</td> <td>4</td> </tr> <tr> <td>SI Pump Room</td> <td>3, 4</td> </tr> <tr> <td>45' RHR Pump Rooms</td> <td>3, 4</td> </tr> <tr> <td colspan="2">None</td> </tr> </tbody> </table>	Unit 1/2 Room/Area	Mode Applicability	78' Electrical Penetration Area	4	64' Switchgear Room	4	SI Pump Room	3, 4	45' RHR Pump Rooms	3, 4	None	
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H	1 Security	None		<b>HOSTILE ACTION</b> within the <b>PROTECTED AREA</b> <b>HS1.1</b> [ 1   2   3   4   5   6   DEF ] A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>PROTECTED AREA</b> as reported by the Security Shift Manager or designee (Note 6)		<b>HOSTILE ACTION</b> within the <b>OWNER CONTROLLED AREA</b> or airborne attack threat within 30 minutes <b>HA1.1</b> [ 1   2   3   4   5   6   DEF ] A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>OCA</b> as reported by the Security Shift Manager or designee (Note 6) <b>OR</b> A <b>VALIDATED</b> notification from NRC of an aircraft attack threat within 30 min. of the site (Note 6)		Confirmed <b>SECURITY CONDITION</b> or threat <b>HU1.1</b> [ 1   2   3   4   5   6   DEF ] (Common Site) A <b>SECURITY CONDITION</b> that does <b>NOT</b> involve a <b>HOSTILE ACTION</b> as reported by the Security Shift Manager or designee (Note 6) <b>OR</b> Notification of a credible security threat directed at the site – (determined by security in accordance with SY-AA-101-132, "Threat Assessment") (Note 6) <b>OR</b> A <b>VALIDATED</b> notification from the NRC providing information of an aircraft threat (Note 6)																																																																											
	2 Seismic Event	None		None		[Refer to CA6.1 or SA9.1 for potential escalation due to a seismic event]		Seismic event greater than OBE levels <b>HU2.1</b> [ 1   2   3   4   5   6   DEF ] Control room personnel feel an actual or potential seismic event <b>AND</b> The occurrence of a seismic event is confirmed in a manner deemed appropriate by the Shift Manager or Emergency Coordinator																																																																											
	3 Natural or Tech. Hazard	None		None		[Refer to CA6.1 or SA9.1 for potential escalation due to a hazardous event]		Hazardous event <b>HU3.1</b> [ 1   2   3   4   5   6   DEF ] (Common Site) <b>HU3.2</b> [ 1   2   3   4   5   6   DEF ] Internal room or area <b>FLOODING</b> of a magnitude sufficient to require manual or automatic electrical isolation of a <b>SAFETY SYSTEM</b> component needed for the current operating mode <b>HU3.3</b> [ 1   2   3   4   5   6   DEF ] (Common Site) Movement of personnel within the <b>PROTECTED AREA</b> is <b>IMPEDED</b> due to an event outside the <b>PROTECTED AREA</b> involving hazardous materials (e.g., an offsite chemical spill or toxic gas release) <b>HU3.4</b> [ 1   2   3   4   5   6   DEF ] (Common Site) A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 7)																																																																											
	4 Fire	None		None		[Refer to CA6.1 or SA9.1 for potential escalation due to fire]		<b>FIRE</b> potentially degrading the level of safety of the plant <b>HU4.1</b> [ 1   2   3   4   5   6   DEF ] A <b>FIRE</b> is <b>NOT</b> extinguished within 15 min. of <b>ANY</b> of the following fire detection indications (Note 1): ● Report from the field (i.e., visual observation) ● Receipt of multiple (more than 1) fire alarms or indications ● Field verification of a single fire alarm <b>AND</b> <b>FIRE</b> is located in <b>ANY Table H-1</b> area <b>HU4.2</b> [ 1   2   3   4   5   6   DEF ] Receipt of a single fire alarm (i.e., <b>NO</b> other indications of a <b>FIRE</b> ) <b>AND</b> The fire alarm is indicating a <b>FIRE</b> within <b>ANY Table H-1</b> area <b>AND</b> The existence of a <b>FIRE</b> is <b>NOT</b> verified within 30 min. of alarm receipt (Note 1) <b>HU4.3</b> [ 1   2   3   4   5   6   DEF ] (Common Site) A <b>FIRE</b> within the plant <b>PROTECTED AREA</b> <b>NOT</b> extinguished within 60 min. of the initial report, alarm or indication (Note 1) <b>HU4.4</b> [ 1   2   3   4   5   6   DEF ] (Common Site) A <b>FIRE</b> within the plant <b>PROTECTED AREA</b> that requires firefighting support by an offsite fire response agency to extinguish																																																																											
	5 Hazardous Gases	None		None		None		Gaseous release <b>IMPEDED</b> access to equipment necessary for normal plant operations, cooldown or shutdown <b>HA5.1</b> [ 3   4   5   6   DEF ] Release of a toxic, corrosive, asphyxiant or flammable gas into <b>ANY Table H-2</b> rooms or areas <b>AND</b> Entry into the room or area is prohibited or <b>IMPEDED</b> (Note 5)																																																																											
	6 Control Room Evacuation	None		None		None		Inability to control a key safety function from outside the Control Room <b>HS6.1</b> [ 1   2   3   4   5   6   DEF ] An event has resulted in plant control being transferred from the Control Room to the Remote Shutdown Panel (RSP) <b>AND</b> Control of <b>ANY</b> of the following key safety functions is <b>NOT</b> reestablished within 15 min. of the last licensed operator leaving the Control Room (Note 1): ● Reactivity (modes 1, 2 and 3 only) ● RCS inventory ● RCS heat removal <b>HA6.1</b> [ 1   2   3   4   5   6   DEF ] An event has resulted in plant control being transferred from the Control Room to the Remote Shutdown Panel (RSP)																																																																											
	7 EC Judgment	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of a <b>GENERAL EMERGENCY</b> <b>HG7.1</b> [ 1   2   3   4   5   6   D ] Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or <b>IMMINENT</b> substantial core degradation or melting with potential for loss of containment integrity or <b>HOSTILE ACTION</b> that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline ( <b>EPA PAGs</b> ) exposure levels offsite for more than the immediate site area.		Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of a <b>SITE AREA EMERGENCY</b> <b>HS7.1</b> [ 1   2   3   4   5   6   D ] Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or <b>HOSTILE ACTION</b> that results in intentional damage or malicious acts, (1) toward site personnel or equipment that could lead to the likely failure of or, (2) that prevent effective access to equipment needed for the protection of the public. <b>ANY</b> releases are <b>NOT</b> expected to result in exposure levels which exceed EPA Protective Action Guideline ( <b>EPA PAGs</b> ) exposure levels beyond the site boundary.		Other conditions exist that in the judgment of the Emergency Coordinator warrant declaration of an <b>ALERT</b> <b>HA7.1</b> [ 1   2   3   4   5   6   D ] Other conditions exist which, in the judgment of the Emergency Coordinator, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of <b>HOSTILE ACTION</b> . Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline ( <b>EPA PAGs</b> ) exposure levels.		Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of an <b>UNUSUAL EVENT</b> <b>HU7.1</b> [ 1   2   3   4   5   6   D ] Other conditions exist which, in the judgment of the Emergency Coordinator, indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. <b>NO</b> releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of <b>SAFETY SYSTEMS</b> occurs.																																																																											

Modes:	1	2	3	4	5	6	DEF	EAL WALL CHART ALL CONDITIONS	SALEM GENERATING STATION	EAL WALL CHART (ALL CONDITIONS) EP-SA-325-140 Revision 02
	Power Operations	Startup	Hot Standby	Hot Shutdown	Cold Shutdown	Refueling	Defueled			

LR-N25-0003

**ENCLOSURE 8**

**EP-SA-325-203, Rev. 2 – Salem Abnormal Rad Levels/Rad Effluent**

**(32 Total Pages)**

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

**Mode Applicability:** All

**EAL# & Classification Level:** **RU1.1 – UNUSUAL EVENT**

**EAL:**

Reading on **ANY** Table R-1 effluent radiation monitor > column "UE" for **≥ 60 min.**  
(Notes 1, 2, 3)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	Plant Vent Effluent Noble Gas Unit 1 + Unit 2	1R41D + 2R41D <b>OR</b> SPDS combined release rate	9.68E+09 μCi/sec	9.68E+08 μCi/sec	9.68E+07 μCi/sec	7.59E+05 μCi/sec
Liquid	Containment Fan Coil Process	1(2)R13A/B	----	----	----	1.64E+03 cpm
	Liquid Radwaste Disposal Process	1R18	----	----	----	U1= 5.50E+05 cpm
		2R18	----	----	----	U2= 9.90E+05 cpm
	Steam Generator Blowdown Process	1R19A-D	----	----	----	U1= 6.40E+03 cpm
2R19A-D		----	----	----	U2= 2.10E+04 cpm	
	Non-Rad Liquid Waste	2R37	----	----	----	6.00E+03 cpm

**Basis:**

This EAL addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses normally occurring continuous radioactivity releases from monitored gaseous or liquid effluent pathways.

Escalation of the emergency classification level would be via EAL RA1.

**Explanation/Discussion/Definitions:**

The column "UE" gaseous release value in Table R-1 (Unit 1 and Unit 2) represents two times the associated effluent monitor alarm set point. Each effluent monitor alarm set point was established to preclude exceeding the ODCM release rate limits.

The plant vent monitors (R41) sample and detect noble gases and collect samples of particulates and iodine discharge through the plant vent. Channel D (R41D) provides the gaseous effluent release rate ( $\mu\text{Ci}/\text{sec}$ ) by combining (product of) the on-range R41A through R41C with plant vent flow ( $\text{cc}/\text{sec}$ ).

The column "UE" liquid release values in Table R-1 represent two (2) times the High Alarm setpoints (except 2R18 which is 1.5 times) associated with the specified monitors. The High Alarm setpoints are obtained from channel calibrations procedures as listed in the reference section of this basis.

Instrumentation that may be used to assess this EAL is listed below:

- Containment Fan Coil Process 1(2)R13A/B (Upper Range is 1.00E+06 cpm)

Service water is used as the cooling medium for the containment fan coil units (CFCUs) and could be contaminated if the cooling coil leaks with containment pressure above Service Water pressure. Since the Service Water System discharges into Circ Water and then back to the river, the fan cooler units will be indirectly monitored for radioactivity. This is done through the use of two monitors for the five fan coolers. The two monitors sample two of the three Circ Water headers that contain Service Water used to cool the CFCUs just before it discharges back to the river. Alarms on these monitors would be indicative of a CFCU leak but could also be associated with other systems including from the pathways monitored by the R18s, R19s and the R37, which also discharge into Circ Water and are monitored by the 1(2)R13A/B. If simultaneous Rad Alarms are received on an R13 monitor along with any R18s, R19s or R37 monitor, then the source of the Rad effluent may not be a CFCU leak and further investigation would be warranted. However, exceeding the EAL threshold value for  $\geq 60$  minutes should result in **UNUSUAL EVENT** classification even if the exact source remains questionable.

- Liquid Radwaste Disposal Process 1(2)R18 (Upper Range is 1.00E+06 cpm)

This channel continuously monitors all Waste Disposal System liquid releases from the plant. Automatic valve closure action is initiated by this monitor when a high radiation level is indicated and alarmed in the Control Room. Liquid Radwaste discharges to Circ Water which then discharges to the Delaware River.

This Unit 1 EAL threshold is based on 2 times the High Alarm Set Point as defined in the Channel Calibration procedure.

This Unit 2 EAL threshold is based on a value that is approximately 1.5 times the High Alarm Set Point as defined in the Channel Calibration procedure which ensures that the threshold value is within the upper range of the monitor.

- Steam Generator Blowdown Process 1(2)R19A-D (Upper Range is 1.00E+06 cpm)

Each of these channels (four channels per unit) monitors the liquid phase of the steam generators for radioactivity, which would indicate a primary-to-secondary system leak. The four steam generator blowdown sample lines each have a radiation monitor. A high radiation alarm signal will close the No. 12 (22) steam generator blowdown tank inlet valves and the steam generator blowdown isolation valves on the affected steam generator.

- Non-Rad Liquid Waste 2R37 (Upper Range is 1.00E+06 cpm)

The non-radwaste basin provides a potential release path due to the fact that steam generator blowdown is directed to the basin during plant startup. This monitor provides

for continuous monitoring of the discharge from the non-radwaste basin. Non-Rad Liquid Waste discharges to Circ Water which then discharges to the Delaware River.

Definitions:

**VALID:** An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AU1 Example EAL #1 and #2
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. FSAR Section 11.4 Radiological Monitoring
4. PSBP 315733(4) Radiation Monitoring System Control Manual
5. Salem ODCM, Section 3/4.11.2 – Gaseous Effluents
6. Salem ODCM Section 3/4.3.3.8 – Radioactive Liquid Effluent Monitoring Instrumentation
7. Salem ODCM Figures 1-1, Liquid Release Flow paths for Unit 1 and Figures 1-2 Liquid Release Flow paths for Unit 2
8. S1(S2).IC-CC.RM-0097/98, Rev. 8, Channel Cal for 1/2R13A/B
9. S1(S2).IC-CC.RM-0028, Rev.18, Channel Cal for 1/2R18
10. S1(S2).IC-CC.RM(FT)-0029/30/31/32, Channel Cal for 1/2R19A/B/C/D
11. S2.IC-CC.RM-0060, Rev.16, Channel Cal for 2R37

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

**Mode Applicability:** All

**EAL# & Classification Level:** **RU1.2 – UNUSUAL EVENT**

**EAL:**

Sample analysis for a gaseous or liquid release indicates a concentration or release rate > **Table R-2** threshold for **≥ 60 min.** (Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that time the limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Table R-2 Effluent Sample Classification Thresholds			
	Release Point	Sample	UE
Gaseous	Plant Vent	NG	1.01E-02 uCi/cc
		I-131	9.38E-07 µCi/cc
	Unmonitored	Isotopic	2 x ODCM 3/4.11.2
Liquid	Containment Fan Coil	Isotopic	2 x ODCM 3/4.11.1
	Liquid Radwaste Disposal	Isotopic	2 x ODCM 3/4.11.1
	Steam Generator Blowdown	Isotopic	2 x ODCM 3/4.11.1
	Chemical Waste Basin	Isotopic	2 x ODCM 3/4.11.1
	Unmonitored	Isotopic	2 x ODCM 3/4.11.1

**Basis:**

This EAL addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent

unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).

Escalation of the emergency classification level would be via EAL RA1.

#### **Explanation/Discussion/Definitions:**

Releases in excess of two times the site Offsite Dose Calculation Manual (ODCM) Section 3/4.11.1 or 3/4.11.2 limits that continue for 60 minutes or longer represent an uncontrolled situation and hence, a potential degradation in the level of safety. The final integrated dose (which is very low in the **UNUSUAL EVENT** emergency class) is not the primary concern here; it is the degradation in plant control implied by the fact that the release was not isolated within 60 minutes.

Table R-2 provides calculated radiological release noble gas and iodine sample concentrations that equate to a release that is 2 times the ODCM limit (Section 3/4.11.2.1) of 500 mRem/year as well as specifying liquid release effluent sample streams 2 times the ODCM limits (Section 3/4.11.1.1).

Each Salem unit has a single gaseous release point (Plant Vent) for which a sample concentration threshold has been calculated.

#### **EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AU1 Example EAL #3
2. Off-Site Dose Calculation Manual, Section 3/4.11.1.1 – Liquid Effluents
3. Off-Site Dose Calculation Manual, Section 3/4.11.2.1 – Gaseous Effluents
4. Salem EAL Rad Set-Point Calculation Document (Attachment 6)

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

**MODE Applicability:** All

**EAL# & Classification Level:** RA1.1 – ALERT

**EAL:**

In the absence of dose assessment results, reading on **ANY** Table R-1 effluent radiation monitor > column "ALERT" for **≥ 15 min.** (Notes 1, 2, 3, 4)

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.
- Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.
- Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	Plant Vent Effluent Noble Gas Unit 1 + Unit 2	1R41D + 2R41D <b>OR</b> SPDS combined release rate	9.68E+09 μCi/sec	9.68E+08 μCi/sec	9.68E+07 μCi/sec	7.59E+05 μCi/sec
Liquid	Containment Fan Coil Process	1(2)R13A/B	----	----	----	1.64E+03 cpm
	Liquid Radwaste Disposal Process	1R18	----	----	----	U1= 5.50E+05 cpm
		2R18	----	----	----	U2= 9.90E+05 cpm
	Steam Generator Blowdown Process	1R19A-D	----	----	----	U1= 6.40E+03 cpm
2R19A-D		----	----	----	U2= 2.10E+04 cpm	
	Non-Rad Liquid Waste	2R37	----	----	----	6.00E+03 cpm

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAG** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to offsite doses that exceed either:

- 10 mRem TEDE
- 50 mRem CDE Thyroid

The column “ALERT” gaseous release value in Table R-1 (Unit 1 + Unit 2) represents 10% of the **SITE AREA EMERGENCY** value the associated effluent monitor alarm set point. Each effluent monitor alarm set point was established to preclude exceeding the ODCM release rate limits.

The plant vent monitors (R41) sample and detect noble gases and collect samples of particulates and iodine discharge through the plant vent. Channel D (R41D) provides the gaseous effluent release rate ( $\mu\text{Ci}/\text{sec}$ ) by combining (product of) the on-range R41A through R41C with plant vent flow ( $\text{cc}/\text{sec}$ ).

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #1
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. UFSAR Section 11.4 Radiological Monitoring
4. PSBP 315733(4) Radiation Monitoring System Control Manual

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<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE
<b>MODE Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RA1.2 – ALERT</b>

**EAL:**

Dose assessment using actual meteorology indicates doses > **10 mrem TEDE** or **50 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA (MEA)** (Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAG** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
2. NEI 99-01 Rev. 6, AA1 Example EAL #2

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

**MODE Applicability:** All

**EAL# & Classification Level:** **RA1.3 – ALERT**

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary (Notes 1, 2):

- Closed window dose rates **> 10 mR/hr** expected to continue **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration **> 3.85E-08  $\mu\text{Ci/cc}$**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAG** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 50 mrem for one hour of inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 1% of the **EPA PAGs**. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 50 mrem/hr for I-131.

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA..

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #4
2. Salem ODCM, Section 3/4.11.1 – Liquid Effluents
3. Salem ODCM, Section 3/4.11.2 – Gaseous Effluents
4. Salem ODCM Section 3.3.8 – Radioactive Liquid Effluent Monitoring Instrumentation
5. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
6. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

**MODE Applicability:** All

**EAL# & Classification Level:** **RA1.4 – ALERT**

**EAL:**

Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > **10 mrem TEDE** or **50 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA** for **60 min.** of exposure (Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAG** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

Dose assessments based on liquid releases are performed per Offsite Dose Calculation Manual.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #3
2. Off-Site Dose Calculation Manual, Section 3/4.11.1 – Liquid Effluents

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

**MODE Applicability:** All

**EAL# & Classification Level:** RS1.1 – SITE AREA EMERGENCY

**EAL:**

In the absence of dose assessment results, reading on **ANY Table R-1** effluent radiation monitor > column "SAE" for **≥ 15 min.** (Notes 1, 2, 3, 4)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	Plant Vent Effluent Noble Gas Unit 1 + Unit 2	1R41D + 2R41D <b>OR</b> SPDS combined release rate	9.68E+09 µCi/sec	9.68E+08 µCi/sec	9.68E+07 µCi/sec	7.59E+05 µCi/sec
Liquid	Containment Fan Coil Process	1(2)R13A/B	----	----	----	1.64E+03 cpm
	Liquid Radwaste Disposal Process	1R18	----	----	----	U1= 5.50E+05 cpm
		2R18				U2= 9.90E+05 cpm
	Steam Generator Blowdown Process	1R19A-D	----	----	----	U1= 6.40E+03 cpm
2R19A-D					U2= 2.10E+04 cpm	
	Non-Rad Liquid Waste	2R37	----	----	----	6.00E+03 cpm

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAG** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to **MEA** doses that exceed 100 mrem TEDE.

The column “SAE” gaseous effluent release value in Table R-1 corresponds to calculated doses of 10% of the **EPA PAGs** (TEDE).

The plant vent monitors (R41) sample and detect noble gases and collect samples of particulates and iodine discharge through the plant vent. Channel D (R41D) provides the gaseous effluent release rate ( $\mu\text{Ci}/\text{sec}$ ) by combining (product of) the on-range R41A through R41C with plant vent flow ( $\text{cc}/\text{sec}$ ).

If dose assessment results are available, EAL RS1.2 would dictate the need for a **SITE AREA EMERGENCY** classification due to abnormal radiation effluents.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**VALID:** An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #1
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. UFSAR Section 11.4 Radiological Monitoring
4. PSBP 315733(4) Radiation Monitoring System Control Manual
5. EPA Protective Action Guidelines

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<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE
<b>MODE Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RS1.2 – SITE AREA EMERGENCY</b>

**EAL:**

Dose assessment using actual meteorology indicates doses > **100 mrem TEDE** or **500 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA (MEA)** (Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAG** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #2
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. UFSAR 2.1.2.2, Boundaries for Establishing Effluent Release Limits
4. EPA Protective Action Guidelines

<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE
<b>MODE Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RS1.3 – SITE AREA EMERGENCY</b>

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary:

- Closed window dose rates > **100 mR/hr** expected to continue for **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration > **3.85E-07 μCi/cc**

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAG** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 500 mrem for one hour of

inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 10% of the **EPA PAGs**. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The I-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 500 mrem/hr for I-131.

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #3
2. Off-Site Dose Calculation Manual, Figure 5.1-3, Area Plot Plan of Site
3. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

**MODE Applicability:** All

**EAL# & Classification Level:** **RG1.1 – GENERAL EMERGENCY**

**EAL:**

In the absence of dose assessment results, reading on **ANY Table R-1** effluent radiation monitor > column "GE" for **≥ 15 min.**  
(Notes 1, 2, 3, 4)

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.
- Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.
- Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	Plant Vent Effluent Noble Gas Unit 1 + Unit 2	1R41D + 2R41D <b>OR</b> SPDS combined release rate	9.68E+09 μCi/sec	9.68E+08 μCi/sec	9.68E+07 μCi/sec	7.59E+05 μCi/sec
	Containment Fan Coil Process	1(2)R13A/B	----	----	----	1.64E+03 cpm
Liquid	Liquid Radwaste Disposal Process	1R18  2R18	----	----	----	U1= 5.50E+05 cpm U2= 9.90E+5 cpm
	Steam Generator Blowdown Process	1R19A-D  2R19A-D	----	----	----	U1= 6.40E+03 cpm U2= 2.10E+04 cpm
	Non-Rad Liquid Waste	2R37	----	----	----	6.00E+03 cpm

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAG** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to **MEA** doses that exceed 1,000 mrem TEDE.

The column “GE” gaseous effluent release value in Table R-1 corresponds to calculated doses of 100% of the **EPA EPGs** (TEDE).

The plant vent monitors (R41) sample and detect noble gases and collect samples of particulates and iodine discharge through the plant vent. Channel D (R41D) provides the gaseous effluent release rate ( $\mu\text{Ci}/\text{sec}$ ) by combining (product of) the on-range R41A through R41C with plant vent flow ( $\text{cc}/\text{sec}$ ).

If dose assessment results are available, EAL RG1.2 would dictate the need for a **GENERAL EMERGENCY** classification due to abnormal radiation effluents.

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #1
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. UFSAR Section 11.4 Radiological Monitoring
4. PSBP 315733(4) Radiation Monitoring System Control Manual
5. EPA Protective Action Guidelines

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<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE
<b>MODE Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RG1.2 – GENERAL EMERGENCY</b>

**EAL:**

Dose assessment using actual meteorology indicates doses > **1,000 mrem TEDE** or **5,000 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA (MEA)** (Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAG** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #2
2. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
3. EPA Protective Action Guidelines

<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE
<b>MODE Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RG1.3 – GENERAL EMERGENCY</b>

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary:

- Closed window dose rates > **1,000 mR/hr** expected to continue for **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration > **3.85E-06 μCi/cc**

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**asis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAG** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAG** for TEDE and thyroid CDE.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 5,000 mRem for one hour of inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 100% of the

**EPA PAGs.** Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The I-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 5,000 mrem/hr for I-131.

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires SGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #3
2. Salem Off-Site Dose Calculation Manual, Figure 5.1-3, Area Plot Plan of Site
3. Salem EAL Rad Set-Point Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines

LR-N25-0003

**ENCLOSURE 9**

**10 CFR 50.54(q) Summary Analysis Report 2024-41,**

**Hope Creek Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**

**EP-HC-325-103, Rev. 3, Section R – Abnormal Rad Levels/Rad Effluent**

**EP-HC-325-140, Rev. 2, Hope Creek EAL Wall Chart (All Conditions)**

**EP-HC-325-203, Rev. 2, Hope Creek Abnormal Rad Levels/Rad Effluent**

**(4 Total Pages)**

**ATTACHMENT 3  
 10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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 Revision 0

**50.54Q I.D. Number:** 2024-41

**50.54Q Title:** Hope Creek Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):  
 EP-HC-325-103, Rev. 3, Offsite Rad Conditions Flow Chart  
 EP-HC-325-140, Rev. 2, HC EAL Wall Chart (All Conditions)  
 EP-HC-325-203, Rev. 2, Offsite Rad Conditions Basis

(Doc #, Rev. #, Name, If applicable)

**Description of the change made to the Emergency Plan/Procedures:**

License Amendment Request (LAR) H23-02, which requested a reduction of the Exclusion Area Boundary (EAB) for the PSEG Nuclear site, was approved by the NRC on 7/15/2024 (ADAMS Accession No. ML24145A177). This amendment is required to be implemented within 180 days, or by 1/11/2025. The Owner Controlled Area (OCA) will be reduced, and its boundary will coincide with the new EAB, with implementation of the LAR. The Protected Area (located within the OCA/EAB) will remain the same, as will the Site Boundary.

Due to the change in distance to the EAB, calculations in Attachment 6 – Hope Creek EAL Rad Set-Point Calculation Document (EP-HC-325-236) were required to be revised (reference 50.54(q) evaluation 2024-39). Emergency Plan definitions were also required to be updated to align the changes to the revised UFSAR (reference 50.54(q) evaluation 2024-09). The purpose of this 50.54(q) evaluation is to evaluate specific changes as listed below, to the HC EALs and ECG documents, to implement the LAR.

Hope Creek EAL changes are as follows, based on the revisions to Attachment 6:

<b>EAL</b>	<b>Current Value</b>	<b>Proposed Value</b>
<b>RU1.1</b>	> 3.0E+04 µCi/sec	> 2.80E+04 µCi/sec
<b>RU1.2</b>	> 7.10E-03 µCi/cc - FRVS NG > 8.20E-06 µCi/cc - FRVS I-131 > 1.52E-03 µCi/cc - NPV NG > 1.80E-06 µCi/cc - NPV I-131 > 1.44E-04 µCi/cc - SPV NG > 1.68E-07 µCi/cc - SPV I-131	> 6.60E-03 µCi/cc - FRVS NG > 9.46E-06 µCi/cc - FRVS I-131 > 1.40E-03 µCi/cc - NPV NG > 2.03E-06 µCi/cc - NPV I-131 > 1.35E-04 µCi/cc - SPV NG > 1.93E-07 µCi/cc - SPV I-131
<b>RA1.1</b>	> 5.25E+06 µCi/sec	> 2.34E+06 µCi/sec
<b>RS1.1</b>	> 5.25E+07 µCi/sec	> 2.34E+07 µCi/sec
<b>RG1.1</b>	> 5.25E+08 µCi/sec	> 2.34E+08 µCi/sec

Specific changes to Hope Creek ECG procedures to implement the Emergency Plan and EAL changes, are listed below.

**EP-HC-325-103:**

- Updated Plant Vent Effluent Offsite Gas Rad Release Rate readings for EALs RU1.1, RA1.1, RS1.1, and RG1.1, due to changes in Attachment 6, EP-HC-325-236.

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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Revision 0

**50.54Q I.D. Number:** 2024-41

**50.54Q Title:** **Hope Creek Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**  
**EP-HC-325-103, Rev. 3, Offsite Rad Conditions Flow Chart**  
**EP-HC-325-140, Rev. 2, HC EAL Wall Chart (All Conditions)**  
**EP-HC-325-203, Rev. 2, Offsite Rad Conditions Basis**

(Doc #, Rev. #, Name, If applicable)

- Updated Sample analysis concentrations for gaseous release for EAL RU1.2, due to changes in Attachment 6, EP-HC-325-236.

**EP-HC-325-140:**

- Updated Table R-1 values for EALs RU1.1, RA1.1, RS1.1, and RG1.1, due to changes in Attachment 6, EP-HC-325-236.
- Updated Table R-2 values for EAL RU1.2, due to changes in Attachment 6, EP-HC-325-236.

**EP-HC-325-203:**

- Updated Table R-1 values in EALs RU1.1, RA1.1, RS1.1, and RG1.1, due to changes in Attachment 6, EP-HC-325-236.
- Updated Table R-2 values in EAL RU1.2, due to changes in Attachment 6, EP-HC-325-236.
- Updated definitions for MEA and OCA in EAL RA1.2, RA1.4, RS1.2, RG1.1, RG1.2, due to changes to Emergency Plan Section 1.
- Updated definitions for OCA and PA in EAL RA1.3, RS1.3, and RG1.3, due to changes to Emergency Plan Section 1.
- For EALs RS1.1 and RG1.1, updated site boundary to MEA in the Explanation section, due to changes to Emergency Plan Section 1.

**Description of why the change is editorial (if not editorial, N/A this block):**

N/A

**Description of the licensing basis affected by the change to the Emergency Plan/Procedure (if not affected, omit this element):**

Implementation of LAR H23-02 will update the licensing basis as described in the Salem and Hope Creek Updated Final Safety Analysis Reports (UFSARs), to account for modifications to the EAB for Salem and Hope Creek. Land parcels designated for use by the New Jersey Wind Port (NJWP) project were removed from the exclusion area. NRC approval was granted for those analyses for which the increase in consequences is more than minimal or that result in a departure from a method of evaluation described in the UFSAR, in accordance with 10 CFR 50.59(c)(2). Updated dose consequences for all analyses remain within the limits of 10 CFR 50.67.

The PSEG Emergency Plan requires an emergency action level scheme be in place to define initiating conditions for placing the plant in an emergency condition. The Emergency Plan does not specify specific EAL parameters and values for the various EAL initiating conditions or threshold values. The proposed

**ATTACHMENT 3  
 10CFR50.54(q) SUMMARY ANALYSIS REPORT**

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 Revision 0

**50.54Q I.D. Number:** 2024-41

**50.54Q Title:** Hope Creek Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):  
 EP-HC-325-103, Rev. 3, Offsite Rad Conditions Flow Chart  
 EP-HC-325-140, Rev. 2, HC EAL Wall Chart (All Conditions)  
 EP-HC-325-203, Rev. 2, Offsite Rad Conditions Basis

(Doc #, Rev. #, Name, If applicable)

change (revisions to values for EALs RU1.1, RU1.2, RA1.1, RS1.1, and RG1.1) does not change the EAL scheme as described in the Emergency Plan.

**A description of how the change to the Emergency Plan/Procedures still complies with regulation:**

Due to changes to the parameters in Attachment 6, HC EAL values are changing as outlined below. The changes are due to new x/Q factors used, due to the distance to the EAB changing (moving closer, towards the reactor). Most of the proposed values are reduced from current values, which would require that an Emergency be declared sooner than it is currently.

EAL	Current Value	Proposed Value
<b>RU1.1</b>	> 3.0E+04 μCi/sec	> 2.80E+04 μCi/sec
<b>RU1.2</b>	> 7.10E-03 μCi/cc - FRVS NG > 8.20E-06 μCi/cc - FRVS I-131 > 1.52E-03 μCi/cc - NPV NG > 1.80E-06 μCi/cc - NPV I-131 > 1.44E-04 μCi/cc - SPV NG > 1.68E-07 μCi/cc - SPV I-131	> 6.60E-03 μCi/cc - FRVS NG > 9.46E-06 μCi/cc - FRVS I-131 > 1.40E-03 μCi/cc - NPV NG > 2.03E-06 μCi/cc - NPV I-131 > 1.35E-04 μCi/cc - SPV NG > 1.93E-07 μCi/cc - SPV I-131
<b>RA1.1</b>	> 5.25E+06 μCi/sec	> 2.34E+06 μCi/sec
<b>RS1.1</b>	> 5.25E+07 μCi/sec	> 2.34E+07 μCi/sec
<b>RG1.1</b>	> 5.25E+08 μCi/sec	> 2.34E+08 μCi/sec

10 CFR 50 Appendix E requires the following:

*Assessment Actions*

*1. The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring.*

**ATTACHMENT 3**  
**10CFR50.54(q) SUMMARY ANALYSIS REPORT**

Page 4 of 4  
Revision 0

**50.54Q I.D. Number:** 2024-41

**50.54Q Title:** **Hope Creek Rad EAL Changes (Implementation of EAB/OCA Reduction LAR):**  
**EP-HC-325-103, Rev. 3, Offsite Rad Conditions Flow Chart**  
**EP-HC-325-140, Rev. 2, HC EAL Wall Chart (All Conditions)**  
**EP-HC-325-203, Rev. 2, Offsite Rad Conditions Basis**

(Doc #, Rev. #, Name, If applicable)

*2. A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.*

The proposed changes to the PSEG Emergency Action Levels do not change the EAL scheme, nor the basis for the individual EALs. The updated values resulting from implementation of LAR H23-02 maintain the scheme as implemented and based on NEI 99-01, Rev. 6. The proposed change does not result in a reduction in effectiveness of the EALs or the PSEG Nuclear Emergency Plan. There were no EP Commitments found for these specific EAL values.

**A description of why the proposed change was not a reduction in the effectiveness of the Emergency Plan/Procedure:**

The proposed changes to Hope Creek EALs and associated ECG documents implement LAR H23-02 and associated Emergency Plan changes. There are no EAL scheme changes associated with this change and the EAL values are not changing in order of magnitude. There is no reduction in effectiveness of the PSEG Nuclear Emergency Plan due to the proposed change.

LR-N25-0003

**ENCLOSURE 10**

**EP-HC-325-103, Rev. 3 – Hope Creek Section R- Abnormal Rad Levels/Rad Effluent**

**(4 Total Pages)**

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

Initiating Condition

Release of gaseous or liquid radioactivity greater than 2 times the ODCM for 60 minutes or longer

OPCON

All

**EAL #**

**RU1.1**

**RU1.1**

**RU1.2**

**RU1.2**

Gaseous Release Rate

**IF**

Liquid Release

**IF**

Gaseous Sample Analysis

**IF**

Liquid Sample Analysis

**IF**

**E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
N  
  
L  
E  
V  
E  
L  
S**

Plant Vent Effluent Offsite Gas Rad Release Rate reading of:

**> 2.80E+04  $\mu$ Ci/sec**

(SPDS Point B5097

**OR**

**SUM** of below listed Effluent Monitors)

- FRVS Vent NG (9RX680)
- NPV NG (9RX590)
- SPV NG (9RX580)
- HTV NG (9RX518)

(Note 3)

Liquid Monitor reading **> 2 x the High Alarm Setpoint** on **ANY** one of the following:

- 9RX508 – Liquid Radwaste Discharge
- 9RX506 – Cooling Tower Blowdown
- 9RX505 – TB Circ Water Discharge

(Note 3)

Sample analysis for a gaseous release indicates a concentration **> ANY** one of the following:

- > **6.60E-03  $\mu$ Ci/cc** - FRVS NG
- > **9.46E-06  $\mu$ Ci/cc** - FRVS I-131
- > **1.40E-03  $\mu$ Ci/cc** - NPV NG
- > **2.03E-06  $\mu$ Ci/cc** - NPV I-131
- > **1.35E-04  $\mu$ Ci/cc** - SPV NG
- > **1.93E-07  $\mu$ Ci/cc** - SPV I-131
- 2x ODCM 3/4.11.2** - for an Unmonitored Release Point

Sample analysis for a liquid release indicates a concentration **> 2 x ODCM 3/4.11.1** for **ANY** one of the below listed Release Points:

- Liquid Radwaste Discharge
- Cooling Tower Blowdown
- TB Circ Water Discharge
- Unmonitored Release Point

**AND**

**≥ 60 minutes** have elapsed  
(Notes 1, 2)

**THEN**

Refer to Attachment 1  
**UNUSUAL EVENT**

**Action Required**

**(Turn Page for ALERT EALs)**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.  
Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.  
Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

R1

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

HCGSECG

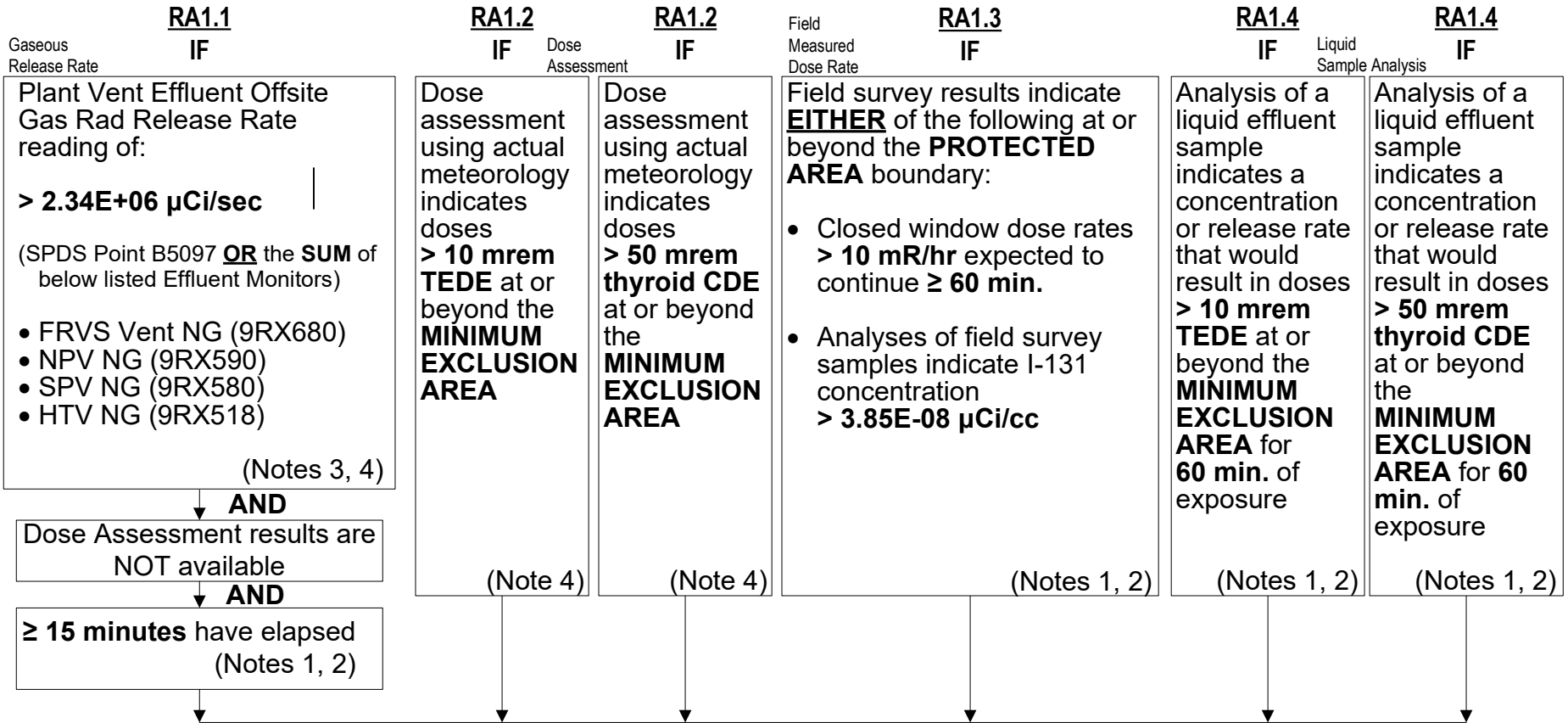
Initiating Condition

Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

OPCON

All

**EAL #**



Action Required

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

(Turn Page for SAE EALs)

**R1**

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

HCGS ECG

Initiating Condition

Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

OPCON

All

**EAL #**

**RS1.1**

**RS1.2**

**RS1.2**

**RS1.3**

Release Rate

**IF**

Dose Assessment

**IF**

**IF**

Field Measured Dose Rate

**IF**

Plant Vent Effluent Offsite Gas Rad Release Rate reading of:

**> 2.34E+07  $\mu$ Ci/sec**

(SPDS Point B5097 **OR** the **SUM** of below listed Effluent Monitors)

- FRVS Vent NG (9RX680)
- NPV NG (9RX590)
- SPV NG (9RX580)
- HTV NG (9RX518)

(Notes 3, 4)

Dose assessment using actual meteorology indicates doses **> 100 mrem TEDE** at or beyond the **MINIMUM EXCLUSION AREA**

(Note 4)

Dose assessment using actual meteorology indicates doses **> 500 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA**

(Note 4)

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary:

- Closed window dose rates **> 100 mR/hr** expected to continue for  **$\geq 60$  min.**
- Analyses of field survey samples indicate I-131 concentration **> 3.85E-07  $\mu$ Ci/cc**

(Notes 1, 2)

**AND**

Dose Assessment results are **NOT** available

**AND**

**$\geq 15$  minutes** have elapsed (Notes 1, 2)

**THEN**

**Refer to Attachment 3  
SITE AREA EMERGENCY**

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.
- Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.
- Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**(Turn Page for GE EALs)**

**R1**

E  
M  
E  
R  
G  
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C  
Y  
  
A  
C  
T  
I  
O  
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L  
E  
V  
E  
L  
S

**Action Required**

# Section R - Abnormal Rad Levels / Rad Effluent

## R1 – Offsite Rad Conditions

HCGS ECG

Initiating Condition

Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

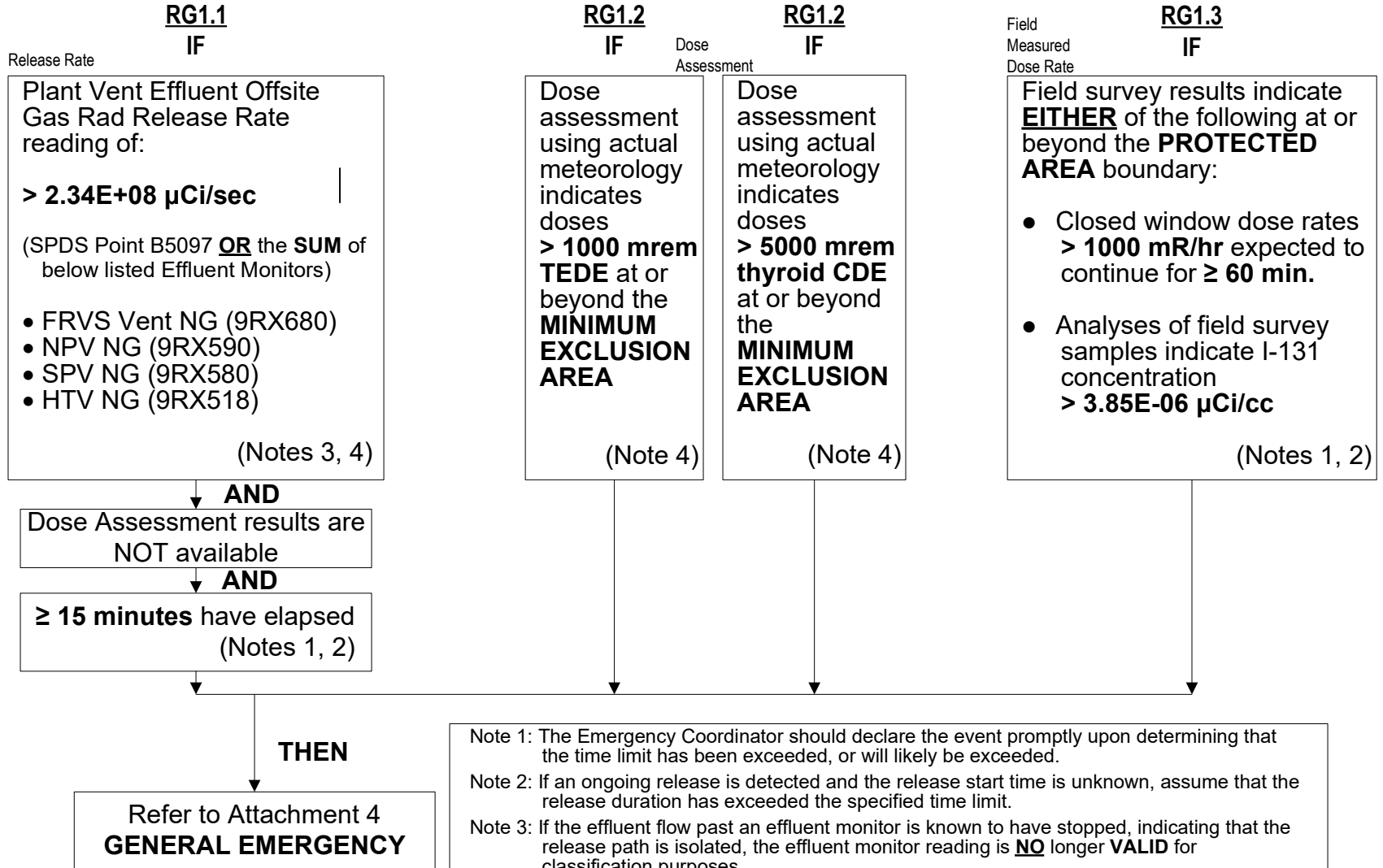
OPCON

All

**EAL #**

E  
M  
E  
R  
G  
E  
N  
C  
Y  
  
A  
C  
T  
I  
O  
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E  
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L  
S

**Action Required**



Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

R1

LR-N25-0003

**ENCLOSURE 11**

**EP-HC-325-140, Rev. 2 - Hope Creek EAL Wall Chart (All Conditions)**

**(1 Total Page)**

	GENERAL EMERGENCY Implement Att. 4	SITE AREA EMERGENCY Implement Att. 3	ALERT Implement Att. 2	UNUSUAL EVENT Implement Att. 1 (Att. 24 for Common Site)
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<b>1</b> Offsite Rad Conditions	Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE <b>RG1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "GE" for <b>≥ 15 min.</b> (Notes 1, 2, 3, 4) <b>RG1.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > <b>1,000 mrem TEDE</b> or <b>5,000 mrem thyroid CDE</b> at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RG1.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: • Closed window dose rates > <b>1,000 mR/hr</b> expected to continue for <b>≥ 60 min.</b> • Analyses of field survey samples indicate I-131 concentration > <b>3.85E-06 µCi/cc</b> (Notes 1, 2)	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE <b>RS1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "SAE" for <b>≥ 15 min.</b> (Notes 1, 2, 3, 4) <b>RS1.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > <b>100 mrem TEDE</b> or <b>500 mrem thyroid CDE</b> at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RS1.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: • Closed window dose rates > <b>100 mR/hr</b> expected to continue for <b>≥ 60 min.</b> • Analyses of field survey samples indicate I-131 concentration > <b>3.85E-07 µCi/cc</b> (Notes 1, 2)	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE <b>RA1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> In the absence of dose assessment results, reading on <b>ANY Table R-1</b> effluent radiation monitor > column "ALERT" for <b>≥ 15 min.</b> (Notes 1, 2, 3, 4) <b>RA1.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > <b>10 mrem TEDE</b> or <b>50 mrem thyroid CDE</b> at or beyond the <b>MINIMUM EXCLUSION AREA</b> (Note 4) <b>RA1.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the <b>PROTECTED AREA</b> boundary: • Closed window dose rates > <b>10 mR/hr</b> expected to continue for <b>≥ 60 min.</b> • Analyses of field survey samples indicate I-131 concentration > <b>3.85E-08 µCi/cc</b> (Notes 1, 2) <b>RA1.4</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > <b>10 mrem TEDE</b> or <b>50 mrem thyroid CDE</b> at or beyond the <b>MINIMUM EXCLUSION AREA</b> for <b>60 min.</b> of exposure (Notes 1, 2)	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer <b>RU1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Reading on <b>ANY Table R-1</b> effluent radiation monitor > column "UE" for <b>≥ 60 min.</b> (Notes 1, 2, 3) <b>RU1.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Sample analysis for a gaseous or liquid release indicates a concentration or release rate > <b>Table R-2</b> threshold for <b>≥ 60 min.</b> (Notes 1, 2)	1	2	3	4	5	DEF	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																																																																						
	1	2	3	4	5	DEF																																																																						
	1	2	3	4	5	DEF																																																																						
1	2	3	4	5	DEF																																																																							
1	2	3	4	5	DEF																																																																							
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1	2	3	4	5	DEF																																																																							
1	2	3	4	5	DEF																																																																							
1	2	3	4	5	DEF																																																																							

<b>2</b> Irradiated Fuel Events	Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer <b>RG2.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Spent fuel pool level <b>CANNOT</b> be restored to at least <b>176 ft.</b> for <b>≥ 60 min.</b> (Note 1)	1	2	3	4	5	DEF	Spent fuel pool level at the top of the fuel racks <b>RS2.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to <b>176 ft.</b>	1	2	3	4	5	DEF	Significant lowering of water level above, or damage to, irradiated fuel <b>RA2.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Uncovery of irradiated fuel in the <b>REFUELING PATHWAY</b> <b>RA2.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Damage to irradiated fuel resulting in a release of radioactivity that causes a High alarm on <b>ANY</b> of the following radiation monitors: • Spent Fuel Storage Pool Area (9RX707) • New Fuel Criticality A Rad (9RX612) • New Fuel Criticality B Rad (9RX613) • Refuel Floor Exhaust Duct Rad Channel A (9RX627) • Refuel Floor Exhaust Duct Rad Channel B (9RX628) • Refuel Floor Exhaust Duct Rad Channel C (9RX629) <b>RA2.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to <b>186 ft.</b>	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	<b>UNPLANNED</b> loss of water level above irradiated fuel <b>RU2.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> <b>UNPLANNED</b> water level drop in the <b>REFUELING PATHWAY</b> as indicated by <b>ANY</b> of the following: • Confirmed SFP low level alarm • Annunciator D1-A5 (FUEL POOL LEVEL HI/LO) • Reactor Water Level Shutdown Range Indicator LI-R605-B21 • Visual observation (local or remote) <b>AND</b> <b>UNPLANNED</b> rise in corresponding area radiation levels on <b>ANY</b> of the following: • Spent Fuel Storage Pool Area (9RX707) • New Fuel Criticality A Rad (9RX612) • New Fuel Criticality B Rad (9RX613) • Temporary Refueling Bridge ARM	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																																		
1	2	3	4	5	DEF																																			
1	2	3	4	5	DEF																																			
1	2	3	4	5	DEF																																			
1	2	3	4	5	DEF																																			
1	2	3	4	5	DEF																																			

Table R-1 Effluent Monitor Classification Thresholds						
Release Point	Monitor	GE	SAE	Alert	UE	
Gaseous	SPDS – (Total) Offsite Gas Rad Release	SPDS Point B5097				
	FRVS Vent NG	9RX680	2.34E+08 µCi/sec	2.34E+07 µCi/sec	2.34E+06 µCi/sec	2.80E+04 µCi/sec
	North Plant Vent NG	9RX590				
	South Plant Vent NG	9RX580				
	Hardened Torus Vent NG	9RX518				
Liquid Radwaste Discharge	9RX508	-----	-----	-----	2X the High Alarm Setpoint	
Liquid	Cooling Tower Blowdown	9RX506	-----	-----	-----	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	-----	-----	-----	2X the High Alarm Setpoint

Table R-3 Safe Operation & Shutdown Rooms/Areas		
Bldg. – Ele.	Room/Area	OPCON Applicability
RB 54'	4113/4109 (RHR A/B Pump Rooms)	3, 4, 5
RB 77'	4201 (10B242 MCC)	3, 4, 5
RB 102'	4307 (B SACS Pump Room)	3, 4, 5
RB 102'	4328/4322 (North/South HCU)	3, 4, 5

<b>3</b> Area Radiation Levels	Radiation levels that <b>IMPEDE</b> access to equipment necessary for normal plant operations, cooldown or shutdown <b>RA3.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Dose rates > <b>15 mR/hr</b> in the Control Room (9RX710 or by survey) <b>RA3.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> An <b>UNPLANNED</b> event results in radiation levels that prohibit or <b>IMPEDE</b> access to <b>ANY Table R-3</b> rooms or areas (Note 5)	1	2	3	4	5	DEF	1	2	3	4	5	DEF	Radiation levels that <b>IMPEDE</b> access to equipment necessary for normal plant operations, cooldown or shutdown None	Damage to a loaded cask <b>CONFINEMENT BOUNDARY</b> <b>RU4.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Damage to a Multi Purpose Canister (MPC) <b>CONFINEMENT BOUNDARY</b> as indicated by on-contact radiation readings <b>≥ EITHER</b> of the following: • <b>600 mR/hr (gamma + neutron)</b> on the surface of the spent fuel cask, excluding the air vents • <b>60 mR/hr (gamma + neutron)</b> on the top of the spent fuel cask	1	2	3	4	5	DEF
	1	2	3	4	5	DEF															
1	2	3	4	5	DEF																
1	2	3	4	5	DEF																

<b>1</b> Security	None	<b>HOSTILE ACTION</b> within the <b>PROTECTED AREA</b> <b>HS1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>PROTECTED AREA</b> as reported by the Security Shift Manager or designee (Note 6)	1	2	3	4	5	DEF	<b>HOSTILE ACTION</b> within the <b>OWNER CONTROLLED AREA</b> or airborne attack threat within 30 minutes <b>HA1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> A <b>HOSTILE ACTION</b> is occurring or has occurred within the <b>OCA</b> as reported by the Security Shift Manager or designee (Note 6) <b>OR</b> A <b>VALIDATED</b> notification from NRC of an aircraft attack threat within <b>30 min.</b> of the site (Note 6)	1	2	3	4	5	DEF	Confirmed <b>SECURITY CONDITION</b> or threat <b>HU1.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) A <b>SECURITY CONDITION</b> that does <b>NOT</b> involve a <b>HOSTILE ACTION</b> as reported by the Security Shift Manager or designee (Note 6) <b>OR</b> Notification of a credible security threat directed at the site – (determined by security in accordance with SY-AA-101-132, "Threat Assessment") (Note 6) <b>OR</b> A <b>VALIDATED</b> notification from the NRC providing information of an aircraft threat (Note 6)	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																
1	2	3	4	5	DEF																	
1	2	3	4	5	DEF																	

<b>2</b> Seismic Event	None	None	None	Seismic event greater than OBE levels <b>HU2.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Actuation of the OBE Seismic Switch (> 0.1 g) as indicated by <b>EITHER</b> : • Annunciator C6-C4 (SEISMIC MON PNL C673) activated • Amber alarm light on the Seismic Switch Power Supply Drawer Panel 10C673	1	2	3	4	5	DEF
	1	2	3	4	5	DEF				

<b>3</b> Natural or Tech. Hazard	None	None	None	Hazardous event <b>HU3.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) A tornado strike within the <b>PROTECTED AREA</b> <b>HU3.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Internal room or area <b>FLOODING</b> of a magnitude sufficient to require manual or automatic electrical isolation of a <b>SAFETY SYSTEM</b> component needed for the current OPCON <b>HU3.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) Movement of personnel within the <b>PROTECTED AREA</b> is <b>IMPEDED</b> due to an event outside the <b>PROTECTED AREA</b> involving hazardous materials (e.g., an offsite chemical spill or toxic gas release) <b>HU3.4</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 7)	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																						
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							

<b>4</b> Fire Hazards	None	None	None	<b>FIRE</b> potentially degrading the level of safety of the plant <b>HU4.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> A <b>FIRE</b> is <b>NOT</b> extinguished within <b>15 min.</b> of <b>ANY</b> of the following fire detection indications (Note 1): • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm <b>AND</b> <b>FIRE</b> is located in <b>ANY Table H-1</b> area <b>HU4.2</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Receipt of a single fire alarm (i.e., <b>NO</b> other indications of a <b>FIRE</b> ) <b>AND</b> The fire alarm is indicating a <b>FIRE</b> within <b>ANY Table H-1</b> area <b>AND</b> The existence of a <b>FIRE</b> is <b>NOT</b> verified within <b>30 min.</b> of alarm receipt (Note 1) <b>HU4.3</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) A <b>FIRE</b> within the plant <b>PROTECTED AREA</b> <b>NOT</b> extinguished within <b>60 min.</b> of the initial report, alarm or indication (Note 1) <b>HU4.4</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> (Common Site) A <b>FIRE</b> within the plant <b>PROTECTED AREA</b> that requires firefighting support by an offsite fire response agency to extinguish	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																						
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							

<b>5</b> Hazardous Gases	None	None	Gaseous release <b>IMPEDED</b> access to equipment necessary for normal plant operations, cooldown or shutdown <b>HA5.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> A Release of a toxic, corrosive, asphyxiant or flammable gas into <b>ANY Table H-2</b> rooms or areas <b>AND</b> Entry into the room or area is prohibited or <b>IMPEDED</b> (Note 5)	1	2	3	4	5	DEF	<b>Table H-2 Safe Operation &amp; Shutdown Rooms/Areas</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Bldg. – Ele.</th> <th>Room/Area</th> <th>OPCON Applicability</th> </tr> </thead> <tbody> <tr> <td>RB 54'</td> <td>4113/4109 (RHR A/B Pump Rooms)</td> <td>3, 4, 5</td> </tr> <tr> <td>RB 77'</td> <td>4201 (10B242 MCC)</td> <td>3, 4, 5</td> </tr> <tr> <td>RB 102'</td> <td>4307 (B SACS Pump Room)</td> <td>3, 4, 5</td> </tr> <tr> <td>RB 102'</td> <td>4328/4322 (North/South HCU)</td> <td>3, 4, 5</td> </tr> </tbody> </table> None	Bldg. – Ele.	Room/Area	OPCON Applicability	RB 54'	4113/4109 (RHR A/B Pump Rooms)	3, 4, 5	RB 77'	4201 (10B242 MCC)	3, 4, 5	RB 102'	4307 (B SACS Pump Room)	3, 4, 5	RB 102'	4328/4322 (North/South HCU)	3, 4, 5
	1	2	3	4	5	DEF																			
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RB 102'	4307 (B SACS Pump Room)	3, 4, 5																							
RB 102'	4328/4322 (North/South HCU)	3, 4, 5																							

<b>6</b> Control Room Evacuation	None	Inability to control a key safety function from outside the Control Room <b>HS6.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Remote Shutdown Panel (RSP) <b>AND</b> Control of <b>ANY</b> of the following key safety functions is <b>NOT</b> reestablished within <b>15 min.</b> of the last licensed operator leaving the Control Room (Note 1): • Reactivity (OPCONs 1 and 2 only) • RPV water level • RCS heat removal	1	2	3	4	5	DEF	Control Room evacuation resulting in transfer of plant control to alternate locations <b>HA6.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Remote Shutdown Panel (RSP)	1	2	3	4	5	DEF	None
	1	2	3	4	5	DEF										
1	2	3	4	5	DEF											

<b>7</b> EC Judgment	Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of a <b>GENERAL EMERGENCY</b> <b>HG7.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or <b>IMMINENT</b> substantial core degradation or melting with potential for loss of containment integrity or <b>HOSTILE ACTION</b> that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline (EPA PAGs) exposure levels offsite for more than the immediate site area.	1	2	3	4	5	DEF	Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of a <b>SITE AREA EMERGENCY</b> <b>HS7.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or <b>IMMINENT</b> major failures of plant functions needed for protection of the public or <b>HOSTILE ACTION</b> that results in intentional damage or malicious acts. (1) toward site personnel or equipment that could lead to the likely failure of, or, (2) that prevent effective access to equipment needed for the protection of the public. <b>ANY</b> releases are <b>NOT</b> expected to result in exposure levels which exceed EPA Protective Action Guideline (EPA PAGs) exposure levels beyond the site boundary.	1	2	3	4	5	DEF	Other conditions exist that in the judgment of the Emergency Coordinator warrant declaration of an <b>ALERT</b> <b>HA7.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the Emergency Coordinator, indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of <b>HOSTILE ACTION</b> . Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline (EPA PAGs) exposure levels.	1	2	3	4	5	DEF	Other conditions existing that in the judgment of the Emergency Coordinator warrant declaration of an <b>UNUSUAL EVENT</b> <b>HU7.1</b> <table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the Emergency Coordinator, indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. <b>NO</b> releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of <b>SAFETY SYSTEMS</b> occurs.	1	2	3	4	5	DEF
	1	2	3	4	5	DEF																						
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							
1	2	3	4	5	DEF																							

<b>OPCON:</b>	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>1</td></tr></table> Power Operations	1	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>2</td></tr></table> Startup	2	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>3</td></tr></table> Hot Shutdown	3	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>4</td></tr></table> Cold Shutdown	4	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>5</td></tr></table> Refueling	5	<table border="1" style="display:inline-table; border-collapse: collapse;"><tr><td>DEF</td></tr></table> Defueled	DEF	<b>EAL WALL CHART ALL CONDITIONS</b>	HOPE CREEK GENERATING STATION	EAL WALL CHART (ALL CONDITIONS)  EP-HC-325-140  Revision 02
1															
2															
3															
4															
5															
DEF															

LR-N25-0003

**ENCLOSURE 12**

**EP-HC-325-203, Rev. 2 – Hope Creek Section R – Abnormal Rad Levels/Rad Effluent**

**(32 Total Pages)**

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

**OPCON Applicability:** All

**EAL# & Classification Level:** **RU1.1 – UNUSUAL EVENT**

**EAL:**

Reading on **ANY** Table R-1 effluent radiation monitor > column "UE" for **≥ 60 min.**  
(Notes 1, 2, 3)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	SPDS – (Total) Offsite Gas Rad Release <b>OR</b> <b>SUM of:</b> FRVS Vent NG + North Plant Vent NG + South Plant Vent NG + Hardened Torus Vent NG	SPDS Point B5097  <b>OR</b> <b>SUM of:</b> 9RX680 + 9RX590 + 9RX580 + 9RX518	2.34E+08 µCi/sec	2.34E+07 µCi/sec	2.34E+06 µCi/sec	2.80E+04 µCi/sec
Liquid	Liquid Radwaste Discharge	9RX508	----	----	----	2X the High Alarm Setpoint
	Cooling Tower Blowdown	9RX506	----	----	----	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	----	----	----	2X the High Alarm Setpoint

**Basis:**

This EAL addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses normally occurring continuous radioactivity releases from monitored gaseous or liquid effluent pathways.

Escalation of the emergency classification level would be via EAL RA1.

**Explanation/Discussion/Definitions:**

The column “UE” gaseous release value in Table R-1 represents two (2) times the calculated ODCM release rate limits.

Instrumentation that may be used to assess this EAL is listed below:

- SPDS Point B5097 – Offsite Gas Rad Release

The SPDS point represents the total sum of Rad Gas Releases of the below 4 potential release pathways.

- 9RX680 (RE-4811A) FRVS Vent Noble Gas

FRVS is normally maintained in a standby condition. Upon FRVS actuation and reactor building isolation, FRVS circulates the reactor building air through HEPA and charcoal filters. Releases are made to the atmosphere via the FRVS Vent Exhaust units.

- 9RX590 (RE-4873B) North Plant Vent (NPV) Noble Gas

The NPV receives discharge from the gaseous radwaste treatment system (Offgas system), Chem Lab exhaust and solid radwaste area exhaust.

- 9RX580 (RE-4875B) South Plant (SPV) Vent Noble gas

The SPV receives discharge from the service/radwaste building, reactor building, condensate demineralizer, pipe chase, turbine building mechanical vacuum pumps, gland seal exhaust, and other untreated ventilation sources.

- 9RX518 Hardened Torus Vent (HTV)

The HTV Rad Gas Release value is a calculated release rate based on HRT Rad detectors 9RX516 (low range) or 9RX517 (high range) and the HTV flow rate. The HTV is not a normal release pathway and is only used when the primary containment is vented per EOP/SAMG guidelines.

The column “UE” liquid release values in Table R-1 represent two (2) times the current High Alarm setpoint based on the current liquid release pathway discharge permit for the specified monitor. Instrumentation that may be used to assess this EAL is listed below:

- 9RX508 (RE-4861) Liquid Radwaste Discharge (Upper Range is 5.8E-02 uCi/cc)

The Liquid Radwaste Discharge Line Monitor provides the alarm and automatic termination of liquid radioactive material releases from the liquid rad waste treatment and monitoring system.

- 9RX506 (RE-8817) Cooling Tower Blowdown (Upper Range is 1.0E-02 uCi/cc)

The Cooling Tower Blowdown Effluent Radiation Monitor monitors radioactivity in the cooling tower blowdown before it is discharged into the Delaware River and warns personnel of an excessive amount of radioactivity (greater than ODCM Limits) being released to the environment. The Cooling-Tower Blowdown Effluent Monitor provides an Alarm function only for releases into the environment.

- 9RX505 (RE-4557) Turbine Building Circulating Water Dewatering Sump Discharge (Upper Range is 5.8E-02 uCi/cc).

The Turbine Building Circulating Water Dewatering Sump Discharge Monitor provides alarm and automatic termination of liquid radioactive releases from the circulating water dewatering sump. The sump pumps discharge to the circulating water system to the cooling tower basin. The Turbine Building Circulating Water Dewatering Sump is a normal radwaste discharge pathway and is monitored as such because of possible contamination from the Turbine Building Ventilation drains.

**Definitions:**

**VALID:** An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AU1 Example EAL #1 and #2
2. HCGS Offsite Dose Calculation Manual (ODCM) Section 3.3.7.11 – Radioactive Gaseous Effluent Monitoring Instrumentation
3. HCGS Offsite Dose Calculation Manual (ODCM), Section 3.3.7.10 – Radioactive Liquid Effluent Monitoring Instrumentation
4. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer

**OPCON Applicability:** All

**EAL# & Classification Level:** **RU1.2 – UNUSUAL EVENT**

**EAL:**

Sample analysis for a gaseous or liquid release indicates a concentration or release rate > **Table R-2** threshold for **≥ 60 min.** (Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Table R-2 Effluent Sample Classification Thresholds			
	Release Point	Sample	Threshold
Gaseous	FRVS Vent	NG	6.60E-03 μCi/cc
		I-131	9.46E-06 μCi/cc
	North Plant Vent	NG	1.40E-03 μCi/cc
		I-131	2.03E-06 μCi/cc
	South Plant Vent	NG	1.35E-04 μCi/cc
		I-131	1.93E-07 μCi/cc
Unmonitored	Isotopic	2 x ODCM 3/4.11.2	
Liquid	Liquid Radwaste Discharge	Isotopic	2 x ODCM 3/4.11.1
	Cooling Tower Blowdown	Isotopic	2 x ODCM 3/4.11.1
	TB Circ Water Discharge	Isotopic	2 x ODCM 3/4.11.1
	Unmonitored	Isotopic	2 x ODCM 3/4.11.1

**Basis:**

This EAL addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).

Escalation of the emergency classification level would be via EAL RA1.

#### **Explanation/Discussion/Definitions:**

Releases in excess of two times the site Offsite Dose Calculation Manual (ODCM) Section 3/4.11.1 or 3/4.11.2 limits that continue for 60 minutes or longer represent an uncontrolled situation and hence, a potential degradation in the level of safety. The final integrated dose (which is very low in the **UNUSUAL EVENT** emergency class) is not the primary concern here; it is the degradation in plant control implied by the fact that the release was not isolated within 60 minutes.

Table R-2 provides calculated radiological release noble gas and iodine sample concentrations that equate to a release that is 2 times the ODCM limits (Section 3/4.11.2.1) of 500 mRem/year as well as specifying liquid release effluent sample streams 2 times the ODCM limits (Section 3/4.11.1.1).

Hope Creek has three gaseous release points for which sample concentration thresholds have been calculated.

- FRVS – Filtration Recirculation Vent System
- NPV – North Plant Vent
- SPV – South Plant Vent

#### **EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AU1 Example EAL #3
2. Off-Site Dose Calculation Manual, Section 3/4.11.1.1 – Liquid Effluents Concentrations
3. Off-Site Dose Calculation Manual, Section 3/4.11.2.1 – Gaseous Effluents Dose Rates
4. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** RA1.1 – ALERT

**EAL:**

In the absence of dose assessment results, reading on **ANY Table R-1** effluent radiation monitor > column "ALERT" for **≥ 15 min.** (Notes 1, 2, 3, 4)

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.
- Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.
- Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	SPDS – (Total) Offsite Gas Rad Release <b>OR</b> <b>SUM of:</b> FRVS Vent NG + North Plant Vent NG + South Plant Vent NG + Hardened Torus Vent NG	SPDS Point B5097  <b>OR</b> <b>SUM of:</b> 9RX680 + 9RX590 + 9RX580 + 9RX518	2.34E+08 μCi/sec	2.34E+07 μCi/sec	2.34E+06 μCi/sec	2.80E+04 μCi/sec
Liquid	Liquid Radwaste Discharge	9RX508	----	----	----	2X the High Alarm Setpoint
	Cooling Tower Blowdown	9RX506	----	----	----	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	----	----	----	2X the High Alarm Setpoint

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAG** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to site boundary doses that exceed either:

- 10 mRem TEDE
- 50 mRem CDE Thyroid

The column “ALERT” gaseous effluent release values in Table R-1 correspond to calculated doses of 1% (10% of the SAE thresholds) of the **EPA PAGs** (TEDE or CDE Thyroid).

Instrumentation that may be used to assess this EAL is listed below:

- SPDS Point B5097 – Offsite Gas Rad Release

The SPDS point represents the total sum of Rad Gas Releases of the below 4 potential release pathways.

- 9RX680 (RE-4811A) FRVS Vent Noble Gas

FRVS is normally maintained in a standby condition. Upon FRVS actuation and reactor building isolation, FRVS circulates the reactor building air through HEPA and charcoal filters. Releases are made to the atmosphere via the FRVS Vent Exhaust units.

- 9RX590 (RE-4873B) North Plant Vent (NPV) Noble Gas

The NPV receives discharge from the gaseous radwaste treatment system (Offgas system), Chem Lab exhaust and solid radwaste area exhaust.

- 9RX580 (RE-4875B) South Plant (SPV) Vent Noble gas

The SPV receives discharge from the service/radwaste building, reactor building, condensate demineralizer, pipe chase, turbine building mechanical vacuum pumps, gland seal exhaust, and other untreated ventilation sources

- 9RX518 Hardened Torus Vent (HTV)

The HTV Rad Gas Release value is a calculated release rate based on HRT Rad detectors 9RX516 (low range) or 9RX517 (high range) and the HTV flow rate. The HTV is not a normal release pathway and is only used when the primary containment is vented per EOP/SAMG guidelines.

## Definitions:

**EPA PAGs:** Environment Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**VALID:** An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #1
2. HCGS Offsite Dose Calculation Manual (ODCM) Section 3.3.7.11 – Radioactive Gaseous Effluent Monitoring Instrumentation
3. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)

<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE
<b>OPCON Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RA1.2 – ALERT</b>

**EAL:**

Dose assessment using actual meteorology indicates doses > **10 mrem TEDE** or **50 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA**  
(Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAGs** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #2

<b>EAL Category:</b>	R – Abnormal Rad Levels / Rad Effluent
<b>EAL Subcategory:</b>	1 – Offsite Rad Conditions
<b>Initiating Condition:</b>	Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE
<b>OPCON Applicability:</b>	All
<b>EAL# &amp; Classification Level:</b>	<b>RA1.3 – ALERT</b>

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary. (Notes 1, 2):

- Closed window dose rates **> 10 mR/hr** expected to continue for **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration **> 3.85E-08 μCi/cc**

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAGs** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 50 mrem for one hour of inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 1% of the **EPA PAGs**. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 50 mrem/hr for I-131.

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #4
2. HC Off-Site Dose Calculation Manual, Section 3/4.11.1.1 – Liquid Effluents Concentrations
3. HC Off-Site Dose Calculation Manual, Section 3/4.11.2.1 – Gaseous Effluents Dose Rates
4. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
5. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** RA1.4 – ALERT

**EAL:**

Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > **10 mrem TEDE** or **50 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA** for **60 min.** of exposure (Notes 1, 2)

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the **EPA PAGs** of 1,000 mrem while the 50 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RS1.

**Explanation/Discussion/Definitions:**

Dose assessments based on liquid releases are performed per Offsite Dose Calculation Manual.

Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AA1 Example EAL #3
2. Off-Site Dose Calculation Manual, Section 3/4.11.1.1 – Liquid Effluents Concentrations

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** **RS1.1 – SITE AREA EMERGENCY**

**EAL:**

In the absence of dose assessment results, reading on **ANY Table R-1** effluent radiation monitor > column "SAE" for **≥ 15 min.** (Notes 1, 2, 3, 4)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is **NO** longer **VALID** for classification purposes.

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	SPDS – (Total) Offsite Gas Rad Release <b>OR</b> <b>SUM of:</b> FRVS Vent NG + North Plant Vent NG + South Plant Vent NG + Hardened Torus Vent NG	SPDS Point B5097  <b>OR</b> <b>SUM of:</b> 9RX680 + 9RX590 + 9RX580 + 9RX518	2.34E+08 μCi/sec	2.34E+07 μCi/sec	2.34E+06 μCi/sec	2.8E+04 μCi/sec
Liquid	Liquid Radwaste Discharge	9RX508	----	----	----	2X the High Alarm Setpoint
	Cooling Tower Blowdown	9RX506	----	----	----	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	----	----	----	2X the High Alarm Setpoint

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and unmonitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAGs** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to MEA doses that exceed 100 mrem TEDE.

The column “SAE” gaseous effluent release value in Table R-1 corresponds to calculated doses of 10% of the **EPA PAGs** (TEDE).

Instrumentation that may be used to assess this EAL is listed below:

- SPDS Point B5097 – Offsite Gas Rad Release

The SPDS point represents the total sum of Rad Gas Releases of the below 4 potential release pathways.

- 9RX680 (RE-4811A) FRVS Vent Noble Gas

FRVS is normally maintained in a standby condition. Upon FRVS actuation and reactor building isolation, FRVS circulates the reactor building air through HEPA and charcoal filters. Releases are made to the atmosphere via the FRVS Vent Exhaust units.

- 9RX590 (RE-4873B) North Plant Vent (NPV) Noble Gas

The NPV receives discharge from the gaseous radwaste treatment system (Offgas system), Chem Lab exhaust and solid radwaste area exhaust.

- 9RX580 (RE-4875B) South Plant (SPV) Vent Noble gas

The SPV receives discharge from the service/radwaste building, reactor building, condensate demineralizer, pipe chase, turbine building mechanical vacuum pumps, gland seal exhaust, and other untreated ventilation sources. 9RX518 Hardened Torus Vent (HTV)

- The HTV Rad Gas Release value is a calculated release rate based on HRT Rad detectors 9RX516 (low range) or 9RX517 (high range) and the HTV flow rate. The HTV is not a normal release pathway and is only used when the primary containment is vented per EOP/SAMG guidelines.

If dose assessment results are available, EAL RS1.2 would dictate the need for a **SITE AREA EMERGENCY** classification due to abnormal radiation effluents.

Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**VALID:** An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #1
2. HCGS Offsite Dose Calculation Manual (ODCM) Section 3.3.7.11 – Radioactive Gaseous Effluent Monitoring Instrumentation
3. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** **RS1.2 – SITE AREA EMERGENCY**

**EAL:**

Dose assessment using actual meteorology indicates doses > **100 mrem TEDE** or **500 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA**  
(Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAGs** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #2
2. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
3. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** **RS1.3 – SITE AREA EMERGENCY**

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary.

- Closed window dose rates > **100 mR/hr** expected to continue for **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration > **3.85E-07 µCi/cc**

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the **EPA PAGs** of 1,000 mrem while the 500 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Escalation of the emergency classification level would be via EAL RG1.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 500 mrem for one hour of inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 10% of the **EPA PAGs**. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AS1 Example EAL #3
2. HCGS Offsite Dose Calculation Manual Figure 5.1.1-1, Area Plot Plan of Site
3. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines

- EAL Category:** R – Abnormal Rad Levels / Rad Effluent
- EAL Subcategory:** 1 – Offsite Rad Conditions
- Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE
- OPCON Applicability:** All
- EAL# & Classification Level:** **RG1.1 – GENERAL EMERGENCY**

**EAL:**

In the absence of dose assessment results, reading on **ANY Table R-1** effluent radiation monitor > column "GE" for **≥ 15 min.** (Notes 1, 2, 3, 4)

- Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.
- Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.
- Note 3: If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is no longer **VALID** for classification purposes.
- Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

Table R-1 Effluent Monitor Classification Thresholds						
	Release Point	Monitor	GE	SAE	ALERT	UE
Gaseous	SPDS – (Total) Offsite Gas Rad Release <b>OR</b> <b>SUM of:</b> FRVS Vent NG + North Plant Vent NG + South Plant Vent NG + Hardened Torus Vent NG	SPDS Point B5097  <b>OR</b> <b>SUM of:</b> 9RX680 + 9RX590 + 9RX580 + 9RX518	2.34E+08 μCi/sec	2.34E+07 μCi/sec	2.34E+06 μCi/sec	2.8E+04 μCi/sec
Liquid	Liquid Radwaste Discharge	9RX508	----	----	----	2X the High Alarm Setpoint
	Cooling Tower Blowdown	9RX506	----	----	----	2X the High Alarm Setpoint
	TB Circ Water Discharge	9RX505	----	----	----	2X the High Alarm Setpoint

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAGs** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

**Explanation/Discussion/Definitions:**

This EAL address gaseous radioactivity releases, that for whatever reason, cause effluent radiation monitor readings corresponding to **MEA** doses that exceed 1,000 mrem TEDE.

The column “GE” gaseous effluent release value in Table R-1 corresponds to calculated doses of 100% of the **EPA PAGs** (TEDE).

Instrumentation that may be used to assess this EAL is listed below:

- SPDS Point B5097 – Offsite Gas Rad Release

The SPDS point represents the total sum of Rad Gas Releases of the below 4 potential release pathways.

- 9RX680 (RE-4811A) FRVS Vent Noble Gas

FRVS is normally maintained in a standby condition. Upon FRVS actuation and reactor building isolation, FRVS circulates the reactor building air through HEPA and charcoal filters. Releases are made to the atmosphere via the FRVS Vent Exhaust units.

- 9RX590 (RE-4873B) North Plant Vent (NPV) Noble Gas

The NPV receives discharge from the gaseous radwaste treatment system (Offgas system), Chem Lab exhaust and solid radwaste area exhaust.

- 9RX580 (RE-4875B) South Plant (SPV) Vent Noble gas

The SPV receives discharge from the service/radwaste building, reactor building, condensate demineralizer, pipe chase, turbine building mechanical vacuum pumps, gland seal exhaust, and other untreated ventilation sources.

- 9RX518 Hardened Torus Vent (HTV)

The HTV Rad Gas Release value is a calculated release rate based on HRT Rad detectors 9RX516 (low range) or 9RX517 (high range) and the HTV flow rate. The HTV is not a normal release pathway and is only used when the primary containment is vented per EOP/SAMG guidelines.

If dose assessment results are available, EAL RG1.2 would dictate the need for a **GENERAL EMERGENCY** classification due to abnormal radiation effluents.

**Definitions:**

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #1
2. HCGS Offsite Dose Calculation Manual (ODCM) Section 3.3.7.11 – Radioactive Gaseous Effluent Monitoring Instrumentation
3. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** **RG1.2 – GENERAL EMERGENCY**

**EAL:**

Dose assessment using actual meteorology indicates doses > **1,000 mrem TEDE** or **5,000 mrem thyroid CDE** at or beyond the **MINIMUM EXCLUSION AREA (MEA)** (Note 4)

Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1 and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAGs** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer **VALID** for classification purposes.

**Explanation/Discussion/Definitions:**

## Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**MINIMUM EXCLUSION AREA (MEA):** The closest/shortest distance from a potential radiological release point at either Salem or Hope Creek Generating Station to the Owner Controlled Area (OCA) / Exclusion Area Boundary (EAB). This distance to the MEA at Salem is 0.48 miles (780 meters) and at Hope Creek is 0.29 miles (462 meters). The MEA is used as a dose assessment receptor distance since members of the public could be located there.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**VALID:** An indication, report, or condition is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #2
2. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
3. EPA Protective Action Guidelines

**EAL Category:** R – Abnormal Rad Levels / Rad Effluent

**EAL Subcategory:** 1 – Offsite Rad Conditions

**Initiating Condition:** Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE

**OPCON Applicability:** All

**EAL# & Classification Level:** **RG1.3 – GENERAL EMERGENCY**

**EAL:**

Field survey results indicate **EITHER** of the following at or beyond the **PROTECTED AREA** boundary.

- Closed window dose rates > **1,000 mR/hr** expected to continue for **≥ 60 min.**
- Analyses of field survey samples indicate I-131 concentration > **3.85E-06 μCi/cc**

(Notes 1, 2)

Note 1: The Emergency Coordinator should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.

Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.

**Basis:**

This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the **EPA PAGs**. It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the **EPA PAGs** of 1,000 mrem while the 5,000 mrem thyroid CDE was established in consideration of the 1:5 ratio of the **EPA PAGs** for TEDE and thyroid CDE.

**Explanation/Discussion/Definitions:**

This EAL addresses a radioactivity release field survey I-131 sample concentration or count rate that would result in a Thyroid CDE dose of greater than 5,000 mRem for one hour of inhalation at or beyond the **PROTECTED AREA** boundary. This value exceeds 100% of the

**EPA PAGs.** Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Iodine-131 field survey sample concentration and count rate threshold is based on I-131 dose conversion factors (DCFs) from EPA-400. The thresholds are based on a Thyroid-CDE Dose Rate of 5,000 mrem/hr for I-131.

For the purposes of this EAL, the **PROTECTED AREA** boundary is used as it is an easily determined location to obtain a field survey dose rate reading or to obtain a field sample.

Definitions:

**EPA PAGs:** Environmental Protection Agency Protective Action Guidelines. The EPA PAGs are expressed in terms of dose commitment: 1 Rem TEDE or 5 Rem CDE Thyroid. Actual or projected offsite exposures in excess of the EPA PAGs requires HCGS to recommend protective actions for the general public to offsite planning agencies.

**OWNER CONTROLLED AREA (OCA):** Property including the SGS/HCGS Protected Area (PA) that is owned and controlled by PSEG Nuclear. PSEG Nuclear has the authority to determine all activities including exclusion or removal of personnel and/or property from this area. The OCA boundary and the Exclusion Area boundary are the same over land. NDev LLC property and the PSEG Nuclear LLC property located North and East of NDev LLC Property are outside the OCA.

**PROTECTED AREA (PA):** An area located within the Owner Controlled Area (OCA), encompassed by the Security fence, to which access is controlled.

**EAL Basis Reference(s):**

1. NEI 99-01 Rev. 6, AG1 Example EAL #3
2. HCGS Offsite Dose Calculation Manual Figure 5.1.1-1, Area Plot Plan of Site
3. Hope Creek Radiological EAL Setpoint Calculation Document (Attachment 6)
4. EPA Protective Action Guidelines