United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001

Serial No. 01-742
SS&L/BAG R0
Docket No. 50-280
50-281
License No. DPR-32
DPR-37

December 11, 2001

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
REVISIONS TO EMERGENCY PLAN IMPLEMENTING PROCEDURES

Pursuant to 10 CFR 50.54(q), enclosed are revisions to two Surry Power Station Emergency Plan Implementing Procedures. The revisions do not implement actions which decrease the effectiveness of our Emergency Plan. The Emergency Plan and Implementing Procedures continue to meet the standards of 10 CFR 50.47(b). Please update your manual by performing the actions described in the enclosed tabulation of changes.

Very truly yours,

Richard H. Blount, Site Vice President
Surry Power Station

Enclosure

Commitments contained in this letter: None.

cc: U. S. Nuclear Regulatory Commission, Region II (2 copies)
Sam Nunn Atlanta Federal Center
61 Forsyth Street S.W., Suite 23 T85
Atlanta, Georgia 30303-8931

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

A045

Serial No. 01-742
Surry EPIP Revisions

VIRGINIA ELECTRIC AND POWER COMPANY
REVISION TO SURRY POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

Enclosed are revisions to Surry Power Station Emergency Plan Implementing Procedures. Please take the following actions in order to keep your manual updated with the most recent revisions.

REMOVE AND DESTROY:	EFFECTIVE DATE:	INSERT:	EFFECTIVE DATE:
EPIP-4.08, Rev. 13	09/28/00	EPIP-4.08, Rev. 14	11/29/01
EPIP-4.09, Rev. 11	12/17/97	EPIP-4.09, Rev. 12	11/29/01

Emergency Plan Privacy and Proprietary Material have been removed.
Reference Generic Letter No. 81-27

VIRGINIA POWER
SURRY POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-4.08	INITIAL OFFSITE RELEASE ASSESSMENT (With 6 Attachments)	14 **PAGE** 1 of 12

PURPOSE

Use of backup (manual) dose assessment calculations to assess consequences of actual or potential offsite releases.

ENTRY CONDITIONS

Any of the following:

1. EPIP-4.01, RADIOLOGICAL ASSESSMENT DIRECTOR CONTROLLING PROCEDURE.
2. EPIP-4.03, DOSE ASSESSMENT TEAM CONTROLLING PROCEDURE.
3. CPIP-6.2, RADIOLOGICAL ASSESSMENT COORDINATOR.
4. Direction by the Station Emergency Manager.

Approvals on File

Effective Date 11/29/01

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 1 INITIATE PROCEDURE:

- By: _____

Date: _____

Time: _____

NOTE: An initial offsite release assessment should be performed within 15 minutes of declaration of a General Emergency.

_____ 2 CHECK IF CURRENT EVENT CLASSIFICATION - NOTIFICATION OF UNUSUAL EVENT OR ALERT

IF unknown, THEN GO TO Step 3

OR

IF Site Area or General Emergency, THEN GO TO NOTE prior to Step 6.

NOTE: Evaluation of percent release limits in this procedure makes assumptions about flow rate, isotopic mixture and detector response. Further analysis upon completion of this procedure will be necessary to quantify releases.

_____ 3 CHECK IF EMERGENCY INVOLVES LIQUID RELEASE

GO TO NOTE prior to Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Results of Discharge Tunnel and SRF Liquid Monitor are not additive. The Discharge Tunnel is considered the final liquid effluent release point.

_____ 4 DETERMINE PERCENT RELEASE LIMIT FOR LIQUID RELEASE:

a) Get monitor indications:

- Discharge Tunnel:_____cpm
- SRF RRM-131:_____cpm

b) Use the following equations:

Discharge Tunnel:
cpm x 3.0E-3 = % Release Limit

_____ x 3.0E-3 = _____%

RRM-131:
cpm x 3.37E-4 = % Release Limit

_____ x 3.37E-4 = _____%

c) Compare percent release limit with emergency classification criteria:

- Percent release limit GREATER THAN OR EQUAL TO 1000% - ALERT
- Percent release limit GREATER THAN OR EQUAL TO 100% - NOTIFICATION OF UNUSUAL EVENT
- Percent release limit LESS THAN 100% - RELEASE WITHIN LIMITS

d) Notify RAD or RAC of event classification based on percent release limit for liquid release

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Surry Radwaste Facility (SRF) Vent Monitor RRM-101 information is available from the SRF Control Room.

_____ 5 DETERMINE PERCENT RELEASE LIMIT FOR GASEOUS RELEASE:

IF NO gaseous release, THEN GO TO Step 10.

a) Get highest value of the following:

- VG-110 (cpm)
- VG-131 (µCi/sec and µCi/cc)
- GW-102 (cpm)
- GW-130 (µCi/sec and µCi/cc)
- SV-111 (cpm)
- SV-211 (cpm)
- RRM-101 (cpm)

a) IF all values are NOT available, THEN get value of monitor in alarm.

b) Get vacuum (inches Hg) for the following:

- VG-110
- GW-102

b) IF all values or value for monitor in alarm NOT available, THEN ask RAD or RAC to determine (as applicable):

- If monitor count rate correction needed.
- Estimated vacuum values for monitor(s).

c) Check - INCHES Hg > 3

c) GO TO Step 5.e.

d) Correct monitor count rates for vacuum

$$\frac{\text{Monitor cpm}}{(30 - \text{inches Hg})/30} = \text{Corrected cpm}$$

(STEP 5 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	DETERMINE PERCENT RELEASE LIMIT FOR GASEOUS RELEASE: (Continued)	
	e) Get effluent flow rate (cfm) of the following: • Vent Vent flow rate • Process Vent flow rate • Air ejector flow rate • SRF Vent flow rate	e) IF flow rate NOT available, THEN use design flow rate: • Vent Vent = 172,000 cfm • Process Vent = 310 cfm • Air Ejector = 25 cfm • SRF Vent = 51,340 cfm
	f) Record on Attachment 1 AND Determine total percent release limit	
	g) Compare percent release limit with emergency classification criteria: • Percent release limit GREATER THAN OR EQUAL TO 1000% - ALERT • Percent release limit GREATER THAN OR EQUAL TO 100% - NOTIFICATION OF UNUSUAL EVENT • Percent release limit LESS THAN 100% - RELEASE WITHIN LIMITS	
	h) Notify RAD or RAC of event classification based on percent release limit for gaseous release	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- No release through Air Ejector(s) should be assumed if Air Ejector is diverted to containment.
- The total dose rate from each pathway should be calculated using Attachment 2, 3 and/or 4 if the release is from more than one pathway.

_____ 6 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) FOR VENTILATION RELEASE:

a) Ask SEM (via RAD or RAC) to have someone observe the increasing or decreasing trends of the monitor

b) Check if release pathway is through any of the following:

- Process Vent
- Vent Vent
- Air Ejector
- SRF Vent

b) IF release is through the Main Steam System, THEN GO TO Step 7

OR

IF release is from containment leakage, THEN GO TO Step 8.

(STEP 6 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) FOR VENTILATION RELEASE: (Continued)

c) Check if monitors for affected pathway - OPERABLE:

- Kaman Science
- Eberline (SRF)
- Victoreen

c) IF Kaman Science Monitor inoperable or offscale, THEN do the following:

1) Get parameters:

- Stability Class
- Wind Speed (mph)
- mR/hr from VG-123 or GW-122
- Flow rate (cfm)

2) GO TO Step 6.e.

OR

IF SRF Eberline Monitor inoperable, THEN ask RAD or RAC for guidance

OR

IF Victoreen Monitor offscale or inoperable, THEN do the following:

1) Use Kaman Science Monitor

2) GO TO Step 6.d.

(STEP 6 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) FOR VENTILATION RELEASE: (Continued)

d) Get the following information from RAD or RAC:

1) Monitor number of interest

2) Highest cpm (corrected for vacuum if necessary), µCi/sec and µCi/cc from monitor of interest

3) Flow rate (cfm) for release pathway

4) Stability Class

5) Wind Speed

e) Record above data on Attachment 2

f) Get X/Q and conversion factors from Attachment 5:

- Site Boundary X/Q for Stability Class in effect
- Monitor Conversion Factor (MCF) based on accident type
- TEDE DCF
- THY DCF

g) Record X/Q, wind speed and conversion factors on Attachment 2

h) Determine Site Boundary TEDE and THY CDE, mrem/hr, using Attachment 2

i) Record results of Attachment 2 on Attachment 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- No release is assumed from the AFWPT pathway if the AFWPT is isolated.
- Results of Attachments 2 and 3 are cumulative if the release is through both the Main Steam System and Ventilation System.

_____ 7 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) - MAIN STEAM SYSTEM:

a) Check if actual or potential release pathway through Main Steam Safety Valves or Auxiliary Feedwater Pump Turbine Exhaust (AFWPT)

a) GO TO Step 8.

b) Get number and mR/hr of the monitor(s) of interest from SEM (via RAD or RAC):

Unit 1	Unit 2
Main Steam	Main Steam
MS-124 (A Safety Valves)	MS-224 (A Safety Valves)
MS-125 (B Safety Valves)	MS-225 (B Safety Valves)
MS-126 (C Safety Valves)	MS-226 (C Safety Valves)
Unit 1 AFWPT	Unit 2 AFWPT
MS-129	MS-229

c) Get the following information from RAD or RAC:

- Stability Class
- Wind Speed
- Number of Main Steam Safety Valves that have lifted or may potentially lift
- Status of AFWPT isolation

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

7 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) - MAIN STEAM SYSTEM: (Continued)

d) Get X/Q and conversion factors from Attachment 5:

- Site Boundary X/Q for Stability Class in effect
- Monitor Conversion Factor (MCF) based on accident type
- TEDE DCF
- THY DCF

e) Record X/Q, wind speed, # valves and conversion factors on Attachment 3

f) Determine Site Boundary TEDE and THY CDE, mrem/hr, using Attachment 3

g) Record results of Attachment 3 on Attachment 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Results of Attachments 2, 3 and 4 are cumulative if the release is through the Ventilation System, Main Steam System and Containment.

_____ 8 DETERMINE SITE BOUNDARY DOSE RATE (mrem/hr) - CONTAINMENT LEAKAGE:

a) Check if actual or potential release pathway from Containment Leakage

a) IF NO release pathway from containment, THEN GO TO Step 9.

b) Get CHRRMS reading, R/hr

Unit 1	Unit 2
RMS-127	RMS-227
RMS-128	RMS-228

c) Get the following information from RAD or RAC:

- Stability Class
- Wind Speed

d) Get X/Q and conversion factors from Attachment 5:

- Site Boundary X/Q for Stability Class in effect
- Monitor Conversion Factor (MCF) based on accident type
- TEDE DCF
- THY DCF

e) Record X/Q, wind speed and conversion factors on Attachment 4

f) Determine Site Boundary TEDE and THY CDE, mrem/hr, using Attachment 4

g) Record results of Attachment 4 on Attachment 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 9 DETERMINE DOSE RATES, mrem/hr, AT 2, 5 AND 10 MILES:

a) Use Attachment 6

b) Add results of appropriate release pathways:

- Vent (Attachment 2)
- Main Steam (Attachment 3)
- Containment (Attachment 4)

c) Determine Stability Class correction factor for distance of interest

d) Do calculation

AND

Determine TEDE and THY CDE at 2, 5 and 10 miles

e) Report results to RAD or RAC

_____ 10 TERMINATE EPIP-4.08:

- Give completed EPIP-4.08, forms and other applicable records to the RAD or RAC
- Completed by: _____

Date: _____

Time: _____

-END-

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.08	% RELEASE LIMIT WORKSHEET	14
ATTACHMENT 1		PAGE 1 of 1

Date:_____; Time:_____

% RELEASE LIMIT

VENT VENT:

	CPM *	x	CFM	x	CF	=	%
VG-110:	_____	x	_____	x	4.96 E-8	=	_____
	µCi/sec	x	CF			=	%
VG-131:	_____	x	3.52 E-3			=	_____
	µCi/cc	x	CFM		CF	=	%
VG-131:	_____	x	_____	x	1.66	=	_____

Highest % _____

* Correction for vacuum may be necessary. Refer to Step 5.c.

PROCESS VENT:

	CPM *	x	CFM	x	CF	=	%
GW-102:	_____	x	_____	x	3.07 E-9	=	_____
	µCi/sec	x	CF			=	%
GW-130:	_____	x	2.18 E-5			=	_____
	µCi/cc	x	CFM		CF	=	%
GW-130:	_____	x	_____	x	1.03 E-2	=	_____

Highest % _____

* Correction for vacuum may be necessary. Refer to Step 5.c.

UNIT 1 AIR EJECTOR:

	CPM	x	CFM	x	CF	=	%
SV-111:	_____	x	_____	x	7.16 E-8	=	_____

UNIT 2 AIR EJECTOR:

	CPM	x	CFM	x	CF	=	%
SV-211:	_____	x	_____	x	2.01 E-5	=	_____

SURRY RADWASTE FACILITY:

	CPM	x	CFM	x	CF	=	%
RRM-101:	_____	x	_____	x	1.74 E-6	=	_____

Completed by: _____ TOTAL % RELEASE LIMIT: _____

Date/Time: _____/_____

NOTE: • Site Boundary X/Q and Monitor Conversion Factors (MCF) are provided on Attachment 5.

• VG-123 and GW-122 should only be used when KAMAN or Normal Range Monitors are offscale or inoperable.

Date:_____; Time:_____

VENT VENT:

VG-110: (CPM * x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

VG-131: (µCi/sec x 1.0E-3 x X/Q) / WINDSPEED = Value

(_____ x 1.0E-3 x _____) / _____ = _____

VG-131: (µCi/cc x CFM x 4.72E-1 x X/Q) / WINDSPEED = Value

(_____ x _____ x 4.72E-1 x _____) / _____ = _____

VG-123: (mr/hr x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

* Correction for vacuum may be necessary.
Refer to Steps 6.d.2 and 5.c.

Record highest Vent Vent value (mrem-Ci/Rem-m³) above on Page 3 of Attachment 2.

AIR EJECTOR:

SV-111: (CPM x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

SV-211: (CPM x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

TOTAL OF AIR EJECTORS = _____

Record sum of Air Ejector values on Page 3 of Attachment 2.

NOTE: • Site Boundary X/Q and Monitor Conversion Factors (MCF) are provided on Attachment 5.

• VG-123 and GW-122 should only be used when KAMAN or Normal Range Monitors are offscale or inoperable.

PROCESS VENT:

GW-102: (CPM * x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

GW-130: (µCi/sec x 1.0E-3 x X/Q) / WINDSPEED = Value

(_____ x 1.0E-3 x _____) / _____ = _____

GW-130: (µCi/cc x CFM x 4.72E-1 x X/Q) / WINDSPEED = Value

(_____ x _____ x 4.72E-1 x _____) / _____ = _____

GW-122: (mr/hr x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

* Correction for vacuum may be necessary.
Refer to Steps 6.d.2 and 5.c.

Record highest Process Vent value (mrem-Ci/Rem-m^3) above on Page 3 of Attachment 2.

SURRY RADWASTE FACILITY:

RRM-101: (CPM x CFM x X/Q x MCF) / WINDSPEED = Value

(_____ x _____ x _____ x _____) / _____ = _____

Record Surry Radwaste Facility value on Page 3 of Attachment 2.

__ 1. Record the following monitor values in left-hand column of table below:

- Highest Vent Vent value from Attachment 2 Page 1
- Sum of Air Ejector values from Attachment 2 Page 1
- Highest Process Vent value from Attachment 2 Page 2
- Surry Radwaste Facility value from Attachment 2 Page 2

__ 2. Record TEDE and THY CDE Dose Conversion Factors (DCFs) from Attachment 5 in middle and right-hand columns in table below.

__ 3. Multiply monitor values in left-hand column by TEDE DCF and THY CDE DCF atop middle and right-hand columns in table below. Record result(s) in intersecting space.

__ 4. Add resulting values in middle and right-hand columns to calculate Total Vent Release (TEDE and THY CDE).

	TEDE DCF from Attachment 5	THY CDE DCF from Attachment 5
HIGHEST VENT VENT VALUE		
SUM OF AIR EJECTOR VALUES		
HIGHEST PROCESS VENT VALUE		
SURRY RADWASTE FACILITY		N/A
SUM OF VENT VENT, PROCESS VENT, AIR EJECTORS AND SURRY RADWASTE FACILITY	SUM TEDE mrem/hr	SUM THY CDE mrem/hr

Completed by: _____

Date/Time: _____/_____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.08	MAIN STEAM RELEASE - SITE BOUNDARY DOSE RATE	14
ATTACHMENT 3		PAGE 1 of 2

NOTE: Monitor Conversion Factors (MCF) and Site Boundary X/Q are provided on Attachment 5.

Date:_____; Time:_____

UNIT 1 MAIN STEAM:

(mr/hr x # Valves x X/Q x MCF) / WINDSPEED = Value

MS-124:(_____ x _____ x _____ x _____) / _____ = _____

MS-125:(_____ x _____ x _____ x _____) / _____ = _____

MS-126:(_____ x _____ x _____ x _____) / _____ = _____

TOTAL OF UNIT 1 MAIN STEAM = _____

UNIT 1 AFWPT:

(mr/hr x X/Q x MCF) / WINDSPEED = Value

MS-129:(_____ x _____ x _____) / _____ = _____

UNIT 2 MAIN STEAM:

(mr/hr x # Valves x X/Q x MCF) / WINDSPEED = Value

MS-224:(_____ x _____ x _____ x _____) / _____ = _____

MS-225:(_____ x _____ x _____ x _____) / _____ = _____

MS-226:(_____ x _____ x _____ x _____) / _____ = _____

TOTAL OF UNIT 2 MAIN STEAM = _____

UNIT 2 AFWPT:

(mr/hr x MCF x X/Q) / WINDSPEED = Value

MS-229:(_____ x _____ x _____) / _____ = _____

__ 1. Record the following monitor values in left-hand column of table below:

- Total Main Steam value for affected unit
- AFWPT value for affected unit

__ 2. Record TEDE and THY CDE Dose Conversion Factors (DCFs) from Attachment 5 in middle and right-hand columns in table below.

__ 3. Multiply monitor values in left-hand column by TEDE DCF and THY CDE DCF atop middle and right-hand columns in table below. Record result(s) in intersecting space.

__ 4. Add resulting values in middle and right-hand columns to calculate Total Main Steam Release (TEDE and THY CDE) (sum of Main Steam and AFWPT).

	TEDE DCF from Attachment 5	THY CDE DCF from Attachment 5
TOTAL OF MAIN STEAM VALUES		
AFWPT VALUE		
SUM OF AFFECTED UNIT(s) MAIN STEAM AND AFWPT	TEDE mrem/hr	THY CDE mrem/hr

Completed by: _____

Date/Time: _____/_____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.08	CONTAINMENT RELEASE - SITE BOUNDARY DOSE RATE	14
ATTACHMENT 4		PAGE 1 of 1

NOTE: • Monitor Conversion Factors (MCF), Site Boundary X/Q, TEDE Dose Conversion Factors (TEDE DCF) and Thyroid CDE Factors (THY DCF) are provided on Attachment 5.

• The CHRRMS Monitor Conversion Factor is calculated for design leak rate of 0.1% per day.

Date:_____; Time:_____

CONTAINMENT:

(R/hr x X/Q x MCF) / WINDSPEED = Value

RMS-127
RMS-128
RMS-227
RMS-228: (_____ x _____ x _____) / _____ = _____

__ 1. Record result of calculation above in left-hand column of table below.

__ 2. Record TEDE and THY CDE Dose Conversion Factors (DCFs) from Attachment 5 in middle and right-hand columns in table below.

__ 3. Multiply monitor value in left-hand column by TEDE DCF and THY CDE DCF atop middle and right-hand columns in table below. Record result(s) in intersecting space (Total Containment Release (TEDE and THY CDE)).

	TEDE DCF from Attachment 5	THY CDE DCF from Attachment 5
CONTAINMENT VALUE	TEDE mrem/hr	THY CDE mrem/hr

Completed by: _____
Date/Time: _____ / _____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.08	SITE BOUNDARY X/Q VALUES, MONITOR CONVERSION FACTORS, TEDE FACTORS, AND THYROID CDE FACTORS	14
ATTACHMENT 5		PAGE 1 of 1

X/Q, SITE BOUNDARY:

STABILITY CLASS						
A	B	C	D	E	F	G
4.82 E-5	1.61 E-4	3.28 E-4	7.54 E-4	1.2 E-3	1.87 E-3	2.44 E-3

MONITOR CONVERSION FACTORS (MCF):

MONITOR	MSLB	SGTR	FHA	WGDT	VCT	LOCA MELT	LOCA GAP	LOCA PC	LKD. ROTOR	NORMAL	SRF
VG-110	1.3E-8	1.3E-8	1.4E-8	------	------	7.6E-9	7.0E-9	1.3E-8	------	1.4E-8	------
VG-123	22.8	15.3	56.6	------	------	1.47	1.40	16.2	------	36.6	------
GW-102	------	------	------	1.07E-7	1.31E-7	------	------	------	------	1.38E-7	------
GW-122	------	------	------	58.1	17.4	------	------	------	------	37.5	------
MS-1(2)24 MS-1(2)25 MS-1(2)26	5.6E+3	4.5E+3	------	------	------	------	------	------	3.87E+2	3.1E+3	------
MS-1(2)29	1.2E+4	1.25E+4	------	------	------	------	------	------	1.9E+3	7.5E+3	------
SV-111	2.3E-9	1.8E-9	------	------	------	2.3E-10	2.3E-10	1.7E-9	2.4E-10	1.7E-9	------
SV-211	6.4E-6	6.6E-6	------	------	------	3.9E-5	1.5E-5	6.6E-6	3.6E-5	6.6E-6	------
RMS-1(2)27 RMS-1(2)28	------	------	------	------	------	7.3E-2	6.9E-2	1.6E-1	-------	------	------
RRM-101	------	------	------	------	------	------	-----	------	-------	1.9E-8	2.6E-7

TEDE DOSE CONVERSION FACTORS (TEDE DCF):

MSLB	SGTR	FHA	WGDT	VCT	LOCA MELT	LOCA GAP	LOCA PC	LKD. ROTOR	SRF
5.5E+3	2.8E+3	3.1E+1	1.78E+1	4.0E+1	1.4E+3	1.8E+3	1.4E+2	7.2E+3	2.1E+2

THYROID CDE DOSE CONVERSION FACTORS (THY DCF):

	MSLB	SGTR	FHA	WGDT	VCT	LOCA MELT	LOCA GAP	LOCA PC	LKD. ROTOR	SRF
UNFILTERED	2.0E+4	5.7E+3	6.8E-1	0	0	7.9E+3	1.6E+4	6.6E+1	3.7E+4	0
FILTERED	2.5E+2	6.9E+1	6.8E-2	0	0	7.9E+2	1.6E+3	6.6E+0	------	0

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.08	DETERMINATION OF 2, 5 AND 10 MILE DOSE RATES	14
ATTACHMENT 6		PAGE 1 of 1

STABILITY CLASS CORRECTION FACTOR

MILES	A	B	C	D	E	F	G
2	1.37E-2	1.12E-2	4.27E-2	6.37E-2	8.33E-2	1.28E-1	2.38E-1
5	6.02E-3	2.36E-3	8.84E-3	1.59E-2	2.42E-2	3.74E-2	7.79E-2
10	3.11E-3	1.24E-3	2.80E-3	5.84E-3	1.00E-2	1.55E-2	3.24E-2

CALCULATION:

SUM OF TEDE:
ATT. 2: _____
ATT. 3: _____
ATT. 4: _____
SUM: _____

TEDE DOSE RATE, SITE BOUNDARY mrem/hr — x

CORRECTION FACTOR 2 miles:	=	TEDE mrem/hr 2 miles:
CORRECTION FACTOR 5 miles:	=	TEDE mrem/hr 5 miles:
CORRECTION FACTOR 10 miles:	=	TEDE mrem/hr 10 miles:

SUM OF THY CDE:
ATT. 2: _____
ATT. 3: _____
ATT. 4: _____
SUM: _____

THY. CDE DOSE RATE SITE BOUNDARY mrem/hr — x

CORRECTION FACTOR 2 miles:	=	THY CDE mrem/hr 2 miles:
CORRECTION FACTOR 5 miles:	=	THY CDE mrem/hr 5 miles:
CORRECTION FACTOR 10 miles:	=	THY CDE mrem/hr 10 miles:

VIRGINIA POWER
SURRY POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-4.09	SOURCE TERM ASSESSMENT (With 6 Attachments)	12 PAGE 1 of 13

PURPOSE

To provide guidance for assessing radioactive releases.

ENTRY CONDITIONS

Any of the following:

1. EPIP-4.01, RADIOLOGICAL ASSESSMENT DIRECTOR CONTROLLING PROCEDURE.
2. EPIP-4.03, DOSE ASSESSMENT TEAM CONTROLLING PROCEDURE.
3. CPIP-6.2, RADIOLOGICAL ASSESSMENT COORDINATOR.

Approvals on File

Effective Date 11/29/01

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 1 INITIATE PROCEDURE:

- By: _____

Date: _____

Time: _____

NOTE:
- Unless otherwise indicated, the Radiological Assessment Director/ Radiological Assessment Coordinator should be consulted when requesting action or information.
- Source term units are expressed in Ci/sec.
- Source term calculations based on monitor readings should be used for initial assessment and to establish trends. Sampling should be performed to more accurately determine source term.

_____ 2 CHECK IF ACTUAL OR POTENTIAL FOR RELEASE FROM CONTAINMENT EXISTS

IF event does NOT involve potential or actual containment release, THEN determine source term from any of the following:

- Effluent sample: GO TO Step 4

OR

- Sample of Station Inventory: GO TO Step 7

OR

- Station monitors: GO TO Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 3 DETERMINE CONTAINMENT SOURCE TERM FROM ANY OF THE FOLLOWING:

- Containment Air Sample: GO TO Step 9

OR

- Containment High Range Monitor: GO TO Step 10

NOTE: Results of each pathway analysis should be recorded on separate worksheets if more than one pathway is sampled.

_____ 4 DETERMINE SOURCE TERM FROM EFFLUENT SAMPLE:

a) Request initiation of EPIP-4.24, GASEOUS EFFLUENT SAMPLING DURING AN EMERGENCY, for sampling of appropriate effluent pathway:

- Ventilation Vent
- Process Vent
- Air Ejector(s)

b) Get monitor reading:

- Maximum: _____
- Reading at time of sample: _____

c) Have Count Room analyze sample:

- Request initiation of EPIP-4.26, HIGH ACTIVITY SAMPLE ANALYSIS, for high activity samples

(STEP 4 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	DETERMINE SOURCE TERM FROM EFFLUENT SAMPLE: (Continued)	
	d) Record nuclide activity on Attachment 1, left column AND Add results to determine Noble Gas and Iodine concentration	d) IF iodine sample NOT taken, THEN continue assessment AND RETURN TO Step 4.d when results are available.
	e) Continue if this is an initial source term assessment	e) GO TO Step 4.g.
	f) Check if sample taken at maximum monitor reading	f) IF sample NOT taken at time of maximum reading, THEN determine corrected µCi/cc for both Noble Gas and Iodine: $\frac{\text{MAX READING}}{\text{READING AT TIME OF SAMPLE}} \times \mu\text{Ci/cc} = \text{CORRECTED } \mu\text{Ci/cc}$
	g) Get effluent flow rate (cfm)	
	h) Record flow rate on Attachment 2	
	i) Record Noble Gas and Iodine concentration on Attachment 2: • Use corrected µCi/cc from Step 4.f (if required)	• IF correction was NOT required, THEN use activity from Attachment 1.
	j) Use Attachment 2 to determine Noble Gas and Iodine release rate, Ci/sec for each pathway	
	k) Add Ci/sec for applicable pathways at end of Attachment 2	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 5	DETERMINE DDE, TEDE AND THYROID CDE DOSE CONVERSION FACTORS BASED ON SAMPLE RESULTS:	
	a) Use Attachment 1 that was previously filled out for gross activity determination	a) Do Steps 4.a through 4.d AND GO TO Step 5.b.
	b) Do calculations on Attachment 1 to determine the following: • DDE • TEDE • THY CDE	
	c) Determine TEDE/DDE ratio: $\frac{\text{TEDE}}{\text{DDE}}$ = _____ Ratio TEDE/DDE	
	d) Give source term results, Ci/sec, and TEDE/DDE ratio to RAD or RAC	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 6	DETERMINE SITE BOUNDARY DOSE RATES BASED ON EFFLUENT SAMPLE RESULTS:	
	a) Ask RAD or RAC if Site Boundary dose rate calculation based on effluent sample - DESIRED	a) GO TO Step 13.
	b) Record Sample TEDE DCF and Sample THY CDE DCF from Attachment 1 on to Attachment 3	
	c) Get effluent flow rate (cfm) for each affected pathway	
	d) Record CFM on Attachment 3	
	e) Determine Stability Class and wind speed: • Ask RAD or RAC	
	f) Use Attachment 3 Site Boundary X/Q value for appropriate Stability Class and divide by wind speed	
	g) Record corrected X/Q value on calculation line for each affected pathway	
	h) Do calculations to determine Site Boundary TEDE and THY CDE dose rate, mrem/hr	
	i) Give results to RAD or RAC	
	j) GO TO Step 13	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: An error in calculation of gas volume may result due to water level in a tank. Water volume should be subtracted from design volume of the tank if the tank has water in it.

_____ 7 DETERMINE SOURCE TERM FROM STATION INVENTORY:

a) Check if release originated from a gas storage tank (e.g., Waste Gas Decay Tank, Volume Control Tank, etc.)

a) RETURN TO Step 2.

b) Have sample taken from appropriate tank

c) Have Count Room analyze sample:

- Request initiation of EPIP-4.26, HIGH ACTIVITY SAMPLE ANALYSIS, for high activity samples

d) Record sample activity on Attachment 1, left column

e) Use Attachment 1 to calculate gross Noble Gas and Iodine activity

f) Determine release volume (in ft^3):

$$\text{VOLUME } (ft^3) = \frac{P_1 \times V_1 \times T_2}{T_1 \times P_2}$$

- P_1 = Pressure before release, PSIA
- P_2 = Pressure after release, PSIA
- V_1 = Design volume of tank, ft^3
- T_1 = Temperature before release, °K
  = [(°F - 32)/1.8] + 273
- T_2 = Temperature after release, °K
  = [(°F - 32)/1.8] + 273

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

7 DETERMINE SOURCE TERM FROM STATION INVENTORY: (Continued)

g) Determine release volume in milliliters (mls):

_____ x 2.832 E+4 = _____ mls

VOLUME (ft^3) x 2.832 E+4 = VOLUME (mls)

h) Record results on Attachment 2, Station Inventory section:

- Noble Gas activity
- Iodine activity
- Volume of release in mls
- Duration of release in seconds

i) Use Attachment 2 to determine Noble Gas and Iodine release rate, Ci/sec

j) Add Ci/sec from all pathways of concern at bottom of Attachment 2

k) Give results to RAD or RAC

l) GO TO Step 13

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Effluent flow rates may not be needed for Kaman, Main Steam, AFWPT or Containment monitor calculations.
- Kaman monitors are the primary method of assessment. Should Kaman monitors be inoperable, then assessments should continue using Vent Vent or Process Vent Normal and/or High Range monitors.

_____ 8 DETERMINE SOURCE TERM FROM STATION MONITORS:

a) Get monitor readings and effluent flow rates (cfm) for release pathway(s) of concern:

- VG-110, VG-131 and VG-123
- GW-102, GW-130 and GW-122
- SV-111
- SV-211
- Main Steam Readings
- AFWPT readings
- Unit 1 Containment: RMS-127 or -128
- Unit 2 Containment: RMS-227 or -228

b) Record monitor readings and flow rates (where applicable) on Attachment 4

c) Determine accident type

d) Determine status of effluent charcoal filtration

e) Determine Monitor Conversion Factors (MCF) and Iodine Conversion Factors (Iodine CF) from Attachment 5

f) Record Conversion Factors on Attachment 4

g) Do calculations on Attachment 4 to determine Iodine and Noble Gas release rates, Ci/sec

h) Add Ci/sec from all pathways of concern

i) Give results to RAD or RAC

j) GO TO Step 13

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Source term is expressed as Curies in Step 9 below.

_____ 9 DETERMINE SOURCE TERM FROM CONTAINMENT SAMPLE:

a) Ask RAD/RAC if a Containment Air sample is required

a) IF containment air sample NOT required, THEN GO TO Step 10.

b) Record sample results on Attachment 1, left column

b) IF sample results NOT immediately available, THEN GO TO Step 10

AND

RETURN TO Step 9.b when results are available.

c) Determine gross activity for Noble Gas and Iodine (sum results)

d) Record results on Attachment 2, Containment Sample section

e) Check release - IN PROGRESS

e) GO TO Step 9.i

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	DETERMINE SOURCE TERM FROM CONTAINMENT SAMPLE: (Continued)	
	f) Record effluent flow rate (cfm) on Attachment 2	f) IF effluent flow rate NOT known, THEN do the following: 1) Ask Technical Support Team or Engineering Department for flow rate assessment 2) Get containment pressure (P_1, psia) and temperature (T_1, °K) 3) Calculate volume (mls): $\frac{1.05E+12 \times P_1}{T_1}$ = VOLUME (mls), where T_1 = (°F - 32/1.8) + 273 4) Determine total Curies available for release: NG (µCi/ml) _____ x Volume (mls) _____ x 10^{-6} = NG Curies _____ Iodine (µCi/ml) _____ x Volume (mls) _____ x 10^{-6} = Iodine Curies _____ 5) GO TO Step 11.
	g) Use Attachment 2 to determine source term (Ci/sec)	
	h) GO TO Step 11	

(STEP 9 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 DETERMINE SOURCE TERM FROM CONTAINMENT SAMPLE: (Continued)

i) Determine potential source term (Ci/sec):

1) Record 1.3 cfm for containment flow rate on Attachment 2

2) Use Attachment 2 to calculate Ci/sec

3) GO TO Step 11

_____ 10 DETERMINE SOURCE TERM FROM CONTAINMENT MONITOR:

a) Record dose rate (R/hr) from Containment High Range Monitor of affected unit:

Unit 1	Unit 2
RM-127:_____	RM-227:_____
RM-128:_____	RM-228:_____

b) Record number of hours since LOCA: _____

c) Use Attachment 6 to determine Curies (Ci) Noble Gas and Iodines in containment air available for release

d) Determine release rate (Ci/sec):

_____Ci Noble Gas x 3.5E-8 = _____Ci/sec Noble Gas

_____Ci Iodine x 3.5E-8 = _____Ci/sec Iodine

e) Give results to RAD or RAC

_____ 11 CHECK IF MORE THAN ONE RELEASE PATHWAY INVOLVED — GO TO Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 12 RETURN TO STEP 2

_____ 13 TERMINATE EPIP-4.09

AND

RETURN TO PROCEDURE IN EFFECT:

- Give completed EPIP-4.09, forms and other applicable records to the Radiological Assessment Director/Radiological Assessment Coordinator
- By: _____

  Date: _____

  Time: _____

-END-

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	NOBLE GAS, IODINE AND DOSE CONVERSION FACTOR WORKSHEET USING SAMPLE ANALYSIS RESULTS	12
ATTACHMENT 1		PAGE 1 of 1

Sample Identification: _____; Sample Time: _____

NOTE: • Total Noble Gas and Iodine activity, µCi/ml, are for use on Attachment 2.

• Adjusted DDE, TEDE and THY CDE are for use on Attachment 3.

NUCLIDE	ACTIV. µCi/ml		EPA DDE DCF		SAMPLE DDE		EPA TEDE DCF		SAMPLE TEDE		EPA THY CDE DCF		SAMPLE THY CDE
Kr-83M	_____		NA										
Kr-85	_____	x	1.3	=	_____	x	1	=	_____				
Kr-85M	_____	x	93	=	_____	x	1	=	_____				
Kr-87	_____	x	510	=	_____	x	1	=	_____				
Kr-88	_____	x	1300	=	_____	x	1	=	_____				
Kr-89	_____	x	1200	=	_____	x	1	=	_____				
Xe-131M	_____	x	4.9	=	_____	x	1	=	_____				
Xe-133	_____	x	20	=	_____	x	1	=	_____				
Xe-133M	_____	x	17	=	_____	x	1	=	_____				
Xe-135	_____	x	140	=	_____	x	1	=	_____				
Xe-135M	_____	x	250	=	_____	x	1	=	_____				
Xe-137	_____	x	110	=	_____	x	1	=	_____				
Xe-138	_____	x	710	=	_____	x	1	=	_____				
TOTAL NOBLE GAS, µCi/ml: _____					CONTINUE ADDING DOWN				CONTINUE ADDING DOWN				
I-125	_____	x	6.3	=	_____	x	4762	=	_____	x	32	=	_____
I-129	_____	x	4.8	=	_____	x	43750	=	_____	x	33	=	_____
I-131	_____	x	220	=	_____	x	241	=	_____	x	24.5	=	_____
I-132	_____	x	1400	=	_____	x	3.5	=	_____	x	1.6	=	_____
I-133	_____	x	350	=	_____	x	43	=	_____	x	14.6	=	_____
I-134	_____	x	1600	=	_____	x	1.9	=	_____	x	0.43	=	_____
I-135	_____	x	950	=	_____	x	8.5	=	_____	x	4.7	=	_____

TOTAL IODINE, µCi/ml: _____	DDE DCF: _____	TEDE DCF: _____	THY. CDE DCF: _____

Completed by: _____

Date/Time: _____ / _____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	SAMPLE EFFLUENT Ci/sec WORKSHEET	12
ATTACHMENT 2		PAGE 1 of 1

MONITOR	µCi/ml		CFM			Ci/sec NOBLE GAS	Ci/sec IODINE
VENT:	N.G.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=	_____	
	IOD.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=		_____
PV:	N.G.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=	_____	
	IOD.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=		_____
AIR EJECTOR #1:							
	N.G.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=	_____	
	IOD.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=		_____
AIR EJECTOR #2:							
	N.G.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=	_____	
	IOD.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=		_____

STATION INVENTORY:							
	N.G.	x	VOLUME (mls)	x 1.0E-6	/ SECONDS		
	_____	x	_____	x 1.0E-6	/ _____ =	_____	
	IOD.	x	VOLUME (mls)	x 1.0E-6	/ SECONDS		
	_____	x	_____	x 1.0E-6	/ _____ =		_____
CONTAINMENT SAMPLE:							
	N.G.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=	_____	
	IOD.	x	CFM	x 4.72E-4			
	_____	x	_____	x 4.72E-4	=		_____

SUM Ci/sec: _____ NG _____ IOD

Completed by: _____

Date/Time: _____ / _____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	SAMPLE EFFLUENT SITE BOUNDARY DOSE RATE WORKSHEET	12
ATTACHMENT 3		PAGE 1 of 1

NOTE: TEDE and Thyroid CDE factors from Attachment 1 are to be applied to this worksheet.

X/Q, SITE BOUNDARY:

STABILITY CLASS						
A	B	C	D	E	F	G
4.82E-5 Windspeed	1.61E-4 Windspeed	3.28E-4 Windspeed	7.54E-4 Windspeed	1.20E-3 Windspeed	1.87E-3 Windspeed	2.44E-3 Windspeed

MONITOR	TEDE DCF OR THY CDE DCF		CFM				X/Q WINDSPEED		Site Boundary TEDE mrem/hr	Site Boundary THY. CDE mrem/hr
VENT:	TEDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=	_____	
	THY CDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=		_____
PV:	TEDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=	_____	
	THY CDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=		_____
AIR EJECTOR #1:										
	TEDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=	_____	
	THY CDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=		_____
AIR EJECTOR #2:										
	TEDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=	_____	
	THY CDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=		_____

STATION INVENTORY:										
	TEDE	x	VOLUME (mls)	x	1.0E-3 /	SECONDS	x	X/Q/WINDSP.		
	_____	x	_____	x	1.0E-3 /	____	x	_____	=	_____
	THY CDE	x	VOLUME (mls)	x	1.0E-3 /	SECONDS	x	X/Q/WINDSP.		
	_____	x	_____	x	1.0E-3 /	____	x	_____	=	_____

CONTAINMENT SAMPLE:										
	TEDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=	_____	
	THY CDE	x	CFM	x	4.72E-1	x	X/Q/WINDSPEED			
	_____	x	_____	x	4.72E-1	x	_____	=		_____

Completed by: _____

Date/Time: _____ / _____

SUM mrem/hr: _____ TEDE _____ THY CDE

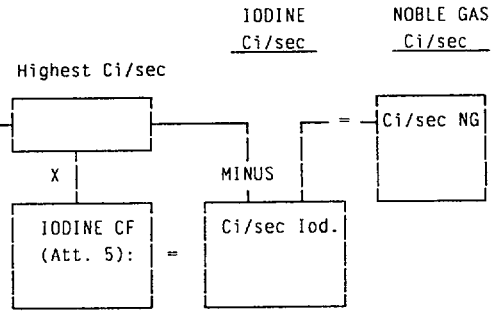
NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	MONITOR Ci/sec WORKSHEET	12
ATTACHMENT 4		PAGE 1 of 2

NOTE: Monitor Conversion Factors (MCF) and Iodine Conversion Factors (Iodine CF) are provided on Attachment 5).

Date:_____; Time:_____

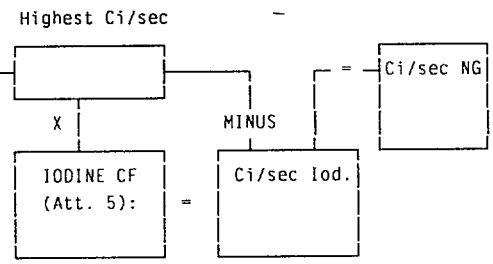
VENT VENT :

	CPM	x	MCF	x	CFM	=	Ci/sec
VG-110:	_____	x	_____	x	_____	=	_____
	µCi/sec	x	1.00E-6			=	Ci/sec
VG-131:	_____	x	1.00E-6			=	_____
	µCi/cc	x	4.72E-4	x	CFM	=	Ci/sec
VG-131:	_____	x	4.72E-4	x	_____	=	_____
	mR/hr	x	MCF	x	CFM	=	Ci/sec
VG-123:	_____	x	_____	x	_____	=	_____



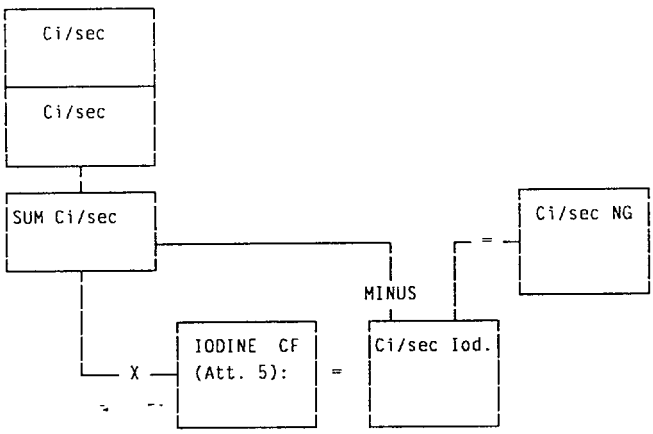
PROCESS VENT:

	CPM	x	MCF	x	CFM	=	Ci/sec
GW-102:	_____	x	_____	x	_____	=	_____
	µCi/sec	x	1.00E-6			=	Ci/sec
GW-130:	_____	x	1.00E-6			=	_____
	µCi/cc	x	4.72E-4	x	CFM	=	Ci/sec
GW-130:	_____	x	4.72E-4	x	_____	=	_____
	mR/hr	x	MCF	x	CFM	=	Ci/sec
GW-122:	_____	x	_____	x	_____	=	_____



AIR EJECTOR:

	CPM	x	MCF	x	CFM	=	Ci/sec
SV-111:	_____	x	_____	x	_____	=	
	CPM	x	MCF	x	CFM	=	Ci/sec
SV-211:	_____	x	_____	x	_____	=	



NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	MONITOR Ci/sec WORKSHEET	12
ATTACHMENT 4		PAGE 2 of 2

IODINE Ci/sec | NOBLE GAS Ci/sec

MAIN STEAM:

	mR/hr	x	# valves	x	MCF	=	Ci/sec
MS-124:		x		x		=	
MS-125:		x		x		=	
MS-126:		x		x		=	
MS-224:		x		x		=	
MS-225:		x		x		=	
MS-226:		x		x		=	

SUM OF Ci/sec → X IODINE CF (Att. 5): = → MINUS Ci/sec Iod. → = Ci/sec NG

AFWPT:

	mR/hr	x	MCF	=	Ci/sec
MS-129:		x		=	
MS-229:		x		=	

Highest Ci/sec → X IODINE CF (Att. 5): = → MINUS Ci/sec Iod. → = Ci/sec NG

CONTAINMENT: NOTE: Monitor Conversion Factor includes 0.1% design basis leak rate.

	R/hr	x	MCF	=	Ci/sec
RMS-127		x		=	
RMS-227					
RMS-128					
RMS-228					

Ci/sec → X IODINE CF (Att. 5): = → MINUS Ci/sec Iod. → = Ci/sec NG

TOTAL Curies/sec:
Sum above results of applicable pathways for Iodine and for Noble gas.

TOTAL Ci/sec IOD | TOTAL Ci/sec NG

Completed by: _____
Date/Time: _____ / _____

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	MONITOR CONVERSION FACTORS AND IODINE CONVERSION FACTORS	12
ATTACHMENT 5		PAGE 1 of 1

MONITOR CONVERSION FACTORS (MCF):

MONITOR	MSLB	SGTR	FHA	WGDT	VCT	LOCA MELT	LOCA GAP	LOCA PC	LKD. ROTOR	NORMAL	SRF
VG-110	1.3E-11	1.3E-11	1.4E-11	------	------	7.6E-12	7.0E-12	1.3E-11	------	1.4E-11	------
VG-123	2.28E-2	1.53E-2	5.66E-2	------	------	1.47E-3	1.40E-3	1.62E-2	------	3.66E-2	------
GW-102	------	------	------	1.07E-10	1.31E-10	------	------	------	------	1.38E-10	------
GW-122	------	------	------	5.81E-2	1.74E-2	------	------	------	------	3.75E-2	------
MS-1(2)24 MS-1(2)25 MS-1(2)26	5.6E+0	4.5E+0	------	------	------	------	------	------	3.87E-1	3.1E+0	------
MS-1(2)29	1.2E+1	1.25E+1	------	------	------	------	------	------	1.9E+0	7.5E+0	------
SV-111	2.3E-12	1.8E-12	------	------	------	2.3E-13	2.3E-13	1.7E-12	2.4E-13	1.7E-12	------
SV-211	6.4E-9	6.6E-9	------	------	-------	3.9E-8	1.5E-8	6.6E-9	3.6E-8	6.6E-9	------
RMS-1(2)27 RMS-1(2)28	------	------	------	------	------	7.3E-5	6.9E-5	1.6E-4	-------	------	------
RRM-101	------	------	------	------	------	------	------	------	-------	1.9E-11	2.6E-10

IODINE CONVERSION FACTORS (IODINE CF):

	MSLB	SGTR	FHA	WGDT	VCT	LOCA MELT	LOCA GAP	LOCA PC	LKD. ROTOR	SRF
UNFILTERED	1.7E-1	1.0E-1	2.4E-3	0	0	3.8E-1	5.4E-1	3.21E-2	2.55E-1	0
FILTERED	2.1E-3	1.2E-3	2.4E-4	0	0	3.8E-2	5.4E-2	3.21E-3	------	0

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-4.09	MATRIX: CHRRMS - EVENT - AVAILABLE CURIES	12
ATTACHMENT 6		PAGE 1 of 2

NOTE:
- No letdown or sprays are assumed available.
- Containment Air concentration (μCi/cc) = Ci Cont. Air x 1.96E-5.
- RCS concentration (μCi/cc) = Ci Cont. Air x 3.83E-3.
- Data is given for 0, 1, 2 and 4 hours after LOCA occurs.

HOURS AFTER LOCA	CHRRMS R/hr	EVENT DESCRIPTION	Ci N.G. Cont. Air	Ci IODINE (HALOGEN) Cont. Air	RCS D.E. I-131 μCi/ml
0	1.3E+6	100% NG, 50% HAL Released to Cont. Air	7.2E+8 Ci	3.87E+8 Ci	1.77E+5 μCi/ml
	1.3E+5	10% NG, 5% HAL Released to Cont. Air	7.2E+7 Ci	3.87E+7 Ci	1.77E+4 μCi/ml
	1.3E+4	1% NG, .5% HAL Released to Cont. Air	7.2E+6 Ci	3.87E+6 Ci	1.77E+3 μCi/ml
	4.5E+4	100% GAP Released to Cont. Air	2.16E+7 Ci	1.55E+7 Ci	7.11E+3 μCi/ml
	4.5E+3	10% GAP Released to Cont. Air	2.16E+6 Ci	1.55E+6 Ci	7.11E+2 μCi/ml
	4.5E+2	1% GAP Released to Cont. Air	2.16E+5 Ci	1.55E+5 Ci	7.11E+1 μCi/ml
	1.54	1% Failed Fuel Primary Gas Release	1.49E+4 Ci	5.05E+2 Ci	6.20E-1 μCi/ml

HOURS AFTER LOCA	CHRRMS R/hr	EVENT DESCRIPTION	Ci N.G. Cont. Air	Ci IODINE (HALOGEN) Cont. Air
1	5.0E+5	100% NG, 50% HAL Released to Cont. Air	3.13E+8 Ci	2.38E+8 Ci
	5.0E+4	10% NG, 5% HAL Released to Cont. Air	3.13E+7 Ci	2.38E+7 Ci
	5.0E+3	1% NG, .5% HAL Released to Cont. Air	3.13E+6 Ci	2.38E+6 Ci
	1.80E+4	100% GAP Released to Cont. Air	9.33E+6 Ci	9.54E+6 Ci
	1.80E+3	10% GAP Released to Cont. Air	9.33E+5 Ci	9.54E+5 Ci
	1.80E+2	1% GAP Released to Cont. Air	9.33E+4 Ci	9.54E+4 Ci
	1.3	1% Failed Fuel Primary Gas Release	1.47E+4 Ci	4.60E+2 Ci

NOTE:
- No Letdown or Sprays are assumed available.
- Containment Air concentration (μCi/cc) = Ci Cont. Air x 1.96-5.
- RCS concentration (μCi/cc) = Ci Cont. Air x 3.83-3.
- Data is given for 0, 1, 2 and 4 hours after LOCA occurs.

HOURS AFTER LOCA	CHRRMS R/hr	EVENT DESCRIPTION	Ci N.G. Cont. Air	Ci IODINE (HALOGEN) Cont. Air
2	3.7E+5	100% NG, 50% HAL Released to Cont. Air	2.75E+8 Ci	1.97E+8 Ci
	3.7E+4	10% NG, 5% HAL Released to Cont. Air	2.75E+7 Ci	1.97E+7 Ci
	3.7E+3	1% NG, .5% HAL Released to Cont. Air	2.75E+6 Ci	1.97E+6 Ci
	1.4E+4	100% GAP Released to Cont. Air	8.24E+6 Ci	7.92E+6 Ci
	1.4E+3	10% GAP Released to Cont. Air	8.24E+5 Ci	7.92E+5 Ci
	1.4E+2	1% GAP Released to Cont. Air	8.24E+4 Ci	7.92E+4 Ci
	1.2	1% Failed Fuel Primary Gas Release	1.45E+4 Ci	4.28E+2 Ci

HOURS AFTER LOCA	CHRRMS R/hr	EVENT DESCRIPTION	Ci N.G. Cont. Air	Ci IODINE (HALOGEN) Cont. Air
4	2.80E+5	100% NG, 50% HAL Released to Cont. Air	2.36E+8 Ci	1.56E+8 Ci
	2.80E+4	10% NG, 5% HAL Released to Cont. Air	2.36E+7 Ci	1.56E+7 Ci
	2.80E+3	1% NG, .5% HAL Released to Cont. Air	2.36E+6 Ci	1.56E+6 Ci
	8.6E+3	100% GAP Released to Cont. Air	7.17E+6 Ci	6.26E+6 Ci
	8.6E+2	10% GAP Released to Cont. Air	7.17E+5 Ci	6.26E+5 Ci
	8.6E+1	1% GAP Released to Cont. Air	7.17E+4 Ci	6.26E+4 Ci
	1.0	1% Failed Fuel Primary Gas Release	1.43E+4 Ci	3.83E+2 Ci