

TITLE: OFFSITE GAMMA RADIATION AND MOBILE AIR SAMPLE SURVEYS

1.0 RESPONSIBLE INDIVIDUAL

Offsite Monitoring Teams (OFMT) and Offsite Monitoring Team Leaders (OFMTL) are responsible to the Radiation Assessment Director (RAD) to:

- 1.1 Survey and record offsite radiological data at selected locations. (See App. B.2)
- 1.2 Report all survey results to the RAD at the ECC.
- 1.3 Assist in the helicopter survey (if necessary).
- 1.4 Recommend survey locations for continuous plume dispersion monitoring.
- 1.5 Ensure data sheets are delivered to RAD for historical purposes.

2.0 CONDITIONS AND PREREQUISITES

- 2.1 As directed by the RAD via the OFMTL.
- 2.2 Suspicion or recognition of an uncontrolled release of radioactive material (a Radiological Event).
- 2.3 Declaration of an Alert, Site Emergency or General Emergency.

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3.0 ACTIONS AND LIMITATIONS

(When Notified, the OFMTL will activate and assemble the OFMT (s) as directed by the RAD).

-NOTE-

Checklists are to be used as determined by the OFMTL. Spaces for initials and times are to be utilized as necessary to help clarify the status.

If the OFMT is to use the helicopter, then proceed directly to step 3.6.

- 3.1 Receive briefing from RAD or OFMTL on site conditions and offsite locations to be monitored.

Location(s):

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Briefing Completed:

Initials / Time

4.3.1-1

-NOTE-

See Appendix B.2 for maps and directions to locate offsite survey points.

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Required Equipment/Vehicle Obtained:

Initials	Time
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-NOTE-

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- 3.3 Perform an equipment and instrument check (use Table 5 of Appendix B.1) prior to leaving the Site.

Instruments and Equipment Checked:

Initials	Time
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**Communications Established:**

Initials	Time
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- 3.5 Ask RAD if the points to be surveyed remain the same and document the changed instructions, if applicable, on EXHIBIT 4.3.1-C, MONITORING TEAM ACTION FORM (check as appropriate):

Survey Points Status: ( ) Unchanged  
(if yes)

( ) Changed  
(if no)

Survey Points Established:

Initials	Time
----------	------

- 3.6 If a helicopter is requested, as directed by the RAD, a new OFMTL will

activate and assemble an additional OFMT (check as appropriate):

Helicopter Required:        ( ) Required  
                                      (if yes)  
                                      ( ) Not Required  
                                      (if no)

-NOTE-

If no helicopter is required, N/A (not applicable) this step and immediately proceed to step 3.7.

Additional OFMT Activated and Assembled:

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

- 3.6.1 Request a briefing on the helicopter landing location and on present plant conditions from the RAD.

Helicopter Landing Location:

\_\_\_\_\_

Estimated Time of Arrival:

\_\_\_\_\_

Briefing Completed:

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

- 3.6.2 Obtain an EMERGENCY MONITORING KIT (MOBILE), and a radio suitable for use from a helicopter. (See ERPIP 4.2.1)

Kit and Radio Obtained:

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

-NOTE-

The Emergency Monitoring Kit (Mobile) can be obtained at the South Guard House.

- 3.6.3 Perform a quick equipment and radio check prior to proceeding (Use Table 5 of Appendix B.1).

Kit and Radio Checked

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

- 3.6.4 Proceed to and meet the helicopter and establish radio contact with the RAD.

Helicopter Landed:

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

Radio Contact Established:

\_\_\_\_\_/\_\_\_\_\_  
Initials    Time

-NOTE-

Record all survey instructions and locations of survey points (Distance in miles

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from the Site and elevation or feet above ground level) on EXHIBIT 4.3.1-C,  
MONITORING TEAM ACTION FORM.

3.6.5 Proceed, as directed by the RAD, to the locations to be surveyed.

Initiated Aerial Survey:

\_\_\_\_\_  
Initials / Time

-CAUTION-

MAINTAIN A MINIMUM ELEVATION OF 100 FEET ABOVE GROUND LEVEL  
WHEN SURVEYING.

3.7 Continuously monitor the general area.

Monitoring of Area Proceeding:

\_\_\_\_\_  
Initials / Time

-NOTE-

Record all survey data and results of the analyses on EXHIBITS 4.3.1-D,  
EXPOSURE RATE FORM, and 4.3.1-E, MONITORING TEAM SURVEY FORM, as  
specified. Additional actions/comments can be entered on EXHIBIT 4.3.1-C.

3.7.1 Using equipment shielded against Beta radiation (i.e. closed window)  
traverse the plume in the crosswind direction, determine the maximum  
mR/h, and record that reading, time the reading was taken, and the  
sector/distance.

Exposure Rate (mR/h): \_\_\_\_\_ Time Reading Was Taken: \_\_\_\_\_

Sector/Distance: \_\_\_\_\_  
Initials / Time

3.7.2 Place a particulate filter and a charcoal cartridge in the air sampler and  
collect a 50 liter sample at the location where the mR/h reading was the  
highest (found during the traverse).

Sample Initiated:

\_\_\_\_\_  
Initials / Time

3.7.3 While collecting the sample, report the specific survey location and  
results of the gamma exposure rate survey to the RAD.

Results Reported:

\_\_\_\_\_  
Initials / Time

3.7.4 Contact the RAD (by radio) to locate a low background area to be used  
for counting and proceed to the area specified.



*Ph. D. David H. Johnson*

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TITLE: OFFSITE SURVEYS OF GROUND DEPOSITION

1.0 RESPONSIBLE INDIVIDUAL

Offsite Monitoring Teams (OFMT) and Offsite Monitoring Team Leaders (OFMTL) are responsible to the Radiological Assessment Director (RAD) for the following:

- 1.1 Survey and recording of offsite ground deposition activity upon request by the RAD.
- 1.2 Reporting of all survey results to the RAD at the ECC.
- 1.3 Ensure all data sheets are delivered to RAD for historical purposes.

2.0 CONDITIONS AND PREREQUISITES

- 2.1 As directed by the RAD per via the OFMTL.
- 2.2 Suspicion or recognition of an uncontrolled release of radioactive material (a Radiological Event).

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3.0 ACTIONS AND LIMITATIONS

(When notified, the OFMTL will activate and assemble the OFMT(s) as directed by the RAD).

- NOTE -

Checklists are to be used as determined by the OFMTL. Spaces for initials and times are to be utilized as necessary to help clarify the status.

- 3.1 Receive briefing from RAD or OFMTL on site conditions, offsite locations to be monitored and type survey instruments to be used. Record on EXHIBIT 4.3.1.1-B the locations and instrument types as follows:

Locations:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Locations:

\_\_\_\_\_

\_\_\_\_\_

Instrument Types:

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Briefing Completed:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

Refer to ERPIP Appendix B.2 for maps.

- 3.2 When directed by the RAD to perform offsite ground deposition surveys, obtain the radiotelephone and Emergency Monitoring Kit at the South Guard House while another OFMT member locates and prepares the survey vehicle. Obtain Required Equipment/Vehicle:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

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- 3.3 Perform an equipment and instrument check (use EXHIBIT 4.3.1.1-C) prior to leaving the Site.

Instruments and Equipment Checked:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

Instrument Types and Serial Numbers  
Recorded on EXHIBIT 4.3.1.1-B

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- 3.4 Establish communications with the ECC using the radiotelephone and proceed to the survey points.

Communications Established:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- 3.5 Ask the RAD if the points to the surveyed and types of instruments remain the same. Document the changed instructions, if applicable, on EXHIBIT 4.3.1.1-A, MONITORING TEAM ACTION FORM. (check as appropriate):

Survey Points Status: ( ) Unchanged (if yes)  
( ) Changed (if no)

Survey Points Established:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

Instrument Type Status: ( ) Unchanged (if yes)  
( ) Changed (if no)

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TITLE: ONSITE GAMMA RADIATION AND MOBILE AIR SAMPLE SURVEYS

## 1.0 RESPONSIBLE INDIVIDUALS

Onsite Monitoring Team (ONMT) and Onsite Monitoring Team Leader (ONMTL) are responsible to the Radiation Protection Director (RPD) to:

- 1.1 Survey and record onsite airborne and liquid pathways radiological data at selected locations and the bay (if necessary).
- 1.2 Report all survey results to the RPD at the OSC.
- 1.3 Recommend survey locations for continued onsite monitoring.

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## 2.0 CONDITIONS AND LIMITATIONS

- 2.1 As directed by the RPD.
- 2.2 Suspicion or recognition of an uncontrolled release of radioactive material.  
(A Radiological Event).
- 2.3 Declaration of an ALERT, SITE EMERGENCY or GENERAL EMERGENCY.

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### 3.0 ACTIONS AND LIMITATIONS

. /  
Action Initiator Time

(When notified, assemble and activate the Onsite Monitoring Team(s) (ONMT) as directed by the Radiation Protection Director (RPD).

-NOTE-

Checklists are to be used as determined by the Onsite Monitoring Team Leader (ONMTL). Spaces for initials and times are to be utilized as necessary to help clarify the status.

- 3.1 Request briefing of site conditions and the specific locations to be monitored.

Location(s):

Briefing Completed:

Initials	Time
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- 3.2 When directed by the RPD to perform an onsite survey, one ONMT member should obtain an EMERGENCY MONITORING KIT (MOBILE) while another ONMT member locates and prepares the survey vehicle (if necessary).

-NOTE-

Radio equipped vehicles are generally parked on road adjacent to Warehouse #1.  
Monitoring Kit (MOBILE) can be obtained from the South Processing Building.  
Portable radios and vehicle keys can be obtained from the ECC storage locker. Keys  
for radio equipped station wagons are alsoin Monitoring Kits.

Vehicle Obtained:  
(if necessary)

/   
Initials Time

Kit Obtained:

/   
Initials Time

- 3.3 Perform a quick equipment and instrument check (use Table 5, Appendix B-1)  
prior to initiating survey.

Equipment & Instruments Checked:

/   
Initials Time

- 3.4 Establish communications with the OSC and the RPD using radio (runners or  
plant page may be used in lieu of the radio).

Communications Established:

/   
Initials Time

-NOTE-

Confirm survey locations during this communication and, if changed,  
document on EXHIBIT 4.3.1-D, MONITORING TEAM ACTION FORM.

- 3.5 Proceed as directed by the RPD to the location where the first survey will be taken.

Arrived at Survey Location:

/   
Initials Time

-NOTE-

Use EXHIBITS 4.3.2-A, PLANT MAP, and 4.3.2-B, SITE MAP, as a guide to the  
survey locations.

- 3.6 Monitor the area.

-NOTE-

Record all data obtained from sections 3.6 and 3.7 on EXHIBITS 4.3.1-D,  
EXPOSURE RATE FORM, and 4.3.1-E, MONITORING TEAM SURVEY FORM,  
as specified. All pertinent information not requested on these forms can be  
recorded on the MONITORING TEAM ACTION FORM, EXHIBIT 4.3.1-C.

- 3.6.1 Using equipment shielded against Beta radiation, traverse the plume  
in the crosswind direction, determine maximum exposure rate in  
mrem/h, and record that reading, time the reading was taken, and the

## ERPIP

### 4.3.2

## REVIEW/APPROVAL

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TITLE: PERSONNEL CONTAMINATION MONITORING

1.0 RESPONSIBLE INDIVIDUAL

Emergency Radiation Team members are responsible to the RPD to perform personnel monitoring during emergencies for the purpose of minimizing personnel exposure and preventing unnecessary spread of contamination. Members of the Emergency Security Team may assist if requested by the RPD and directed by the ESTL.

2.0 CONDITIONS AND PREREQUISITES

When directed by the RPD.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

Use EXHIBIT 4.3.1-C, MONITORING TEAM ACTION FORM, to document results, as necessary

3.1 General

Normal self-monitoring of personnel will be performed at access control points.

3.1.1 Radiation monitoring personnel shall supervise and assist with personnel monitoring as required.

-NOTE-

If contamination is detected on inplant personnel, dress the affected person(s) in appropriate protective clothing and have them proceed to the nearest (safe) decontamination station.

3.1.2 If radiation levels cause the background count on the personnel monitoring instruments to increase greater than 0.2 mrem/h:

3.1.2.1 Move the self-monitoring equipment and control point to a lower radiation level area.

Control Point Moved:

\_\_\_\_\_  
Initials / Time

3.1.2.2 Report location of new control point to the SEC.

New Location Reported:

\_\_\_\_\_  
Initials      Time

3.1.2.3 Continue to assist monitoring of personnel.

3.1.3 Onsite contaminated personnel shall be treated per ERPIP 4.5.5.

3.1.4 Onsite injured, contaminated personnel shall be treated per ERPIPS  
4.6.2, 4.6.3 and 4.6.4, as necessary.

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3.2 Controlled Area Monitoring and Assembly Area Monitoring

3.2.1 If personnel monitoring was NOT performed at a control point,  
(because of radiation levels or other safety hazard), Assembly Area  
Monitoring Team members will monitor personnel using portable  
equipment at the assembly areas when requested by Assembly Area  
Leaders or personnel not monitored.

Monitoring Continued in Assembly Area:

\_\_\_\_\_  
Initials      Time

3.2.2 If, during evacuation, Assembly Areas are utilized for accountability  
and/or cover, Assembly Area Monitoring Team members (and the ECC  
Monitoring Team, if required) will monitor Assembly Areas.

Assembly Areas Monitored:

\_\_\_\_\_  
Initials      Time

3.3 Gate House Monitoring

ALL personnel exiting the protected area will be directed by the Gate and  
Access Monitoring Team through the portal monitors, if the monitors are  
operable.

-NOTE-

If contamination is detected on inplant personnel, dress the affected person(s) in  
appropriate protective clothing and have them proceed to the nearest (safe)  
decontamination station.

3.4 Perimeter Control Point Monitoring

3.4.1 Personnel will be subject to monitoring at the perimeter control point  
by the Gate and Access Monitoring Team if prior personnel  
monitoring was not performed due to emergency evacuation  
conditions.



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TITLE: ASSESSMENT ACTIONS-CONTENTS-

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4.4.2	USE OF MAP OVERLAYS (ISOPLETHS)
4.4.3	INITIAL DETERMINATION OF ACCIDENT RADIOACTIVITY RELEASE RATES
4.4.4	DETERMINATION OF ATMOSPHERIC DISPERSION (X/Q)
4.4.5	INITIAL DETERMINATION OF PROJECTED WHOLE BODY DOSES
4.4.6	INITIAL ESTIMATES OF FISSION PRODUCT RELEASE BASED ON ENVIRONMENTAL MEASUREMENTS
4.4.7	MEANS OF ESTIMATING POST-ACCIDENT CORE DAMAGE
4.4.8	GROUND DEPOSITION (SOIL CONTAMINATION)
4.4.9	ASSESSMENT OF OFFSITE RADIOLOGICAL CONSEQUENCES USING DOSE ASSESSMENT COMPUTER (DAC) SYSTEM.

TITLE: ASSESSMENTS OF OFFSITE RADIOLOGICAL CONSEQUENCES USING DOSE  
ASSESSMENT COMPUTER (DAC) SYSTEM

1.0 OBJECTIVES

The purpose of this procedure is to describe the steps necessary to use the DAC system as a means of performing and coordinating the full range of radiological assessment that may be required in the event of an emergency.

2.0 DISCUSSION

The Calvert Cliffs Nuclear Power Plant Emergency Response Plan requires three basic series of calculations. The first are those to classify or reclassify the severity of the event based on an actual or projected release of radioactivity to the environment (ERPIP 4.4.1). The second series comprise calculations made to project the consequences of a release of noble gases at various offsite locations; these initial estimates are based on the reasonable expectation that the immediate consequences of an accident will be dominated by noble gas releases (ERPIPs 4.4.2, 4.4.5). The third series includes any calculation used to make more refined estimates, to take into account releases of halogens or nongaseous fission products (or to infer the extent of core damage based on inplant or offsite measurements) (ERPIP 4.4.6, 4.4.7 and Appendix C).

The DAC system can be used to perform each of these assessments quickly without the need to perform calculations manually and without the need to manually log input and output at each step. Moreover, the DAC has capabilities that can be used to perform quantitative assessments (such as the effect of changes in wind direction or stability conditions) that can generally be done only qualitatively by manual methods of analysis.

3.0 ACTIONS AND LIMITATIONS

A brief summary of the use of DAC to perform accident dose assessments is provided in Appendix C.4. A series of six control "keys" (or pushbuttons) are used. Each key represents a station point for a different type of calculation. The procedures for using each menu line item appears in Exhibit 4.4.9-G. EXHIBIT C.4-1 provides an overall summary list of the options for each pushbutton "menu" item.

The DAC system is programmed to minimize the input required by users. The procedures that follow are intended to address the kinds of calculations that will be required under ERPIP 4.4.1 through ERPIP 4.4.7. The system is also capable of performing very complex calculations, which may be required when releases are very large and extend over many hours. In such instances, a specialist should be consulted to permit full utilization of the system in aid of emergency actions (See Appendix A.2).

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### 3.1 INITIAL CLASSIFICATION OF EMERGENCY CONDITIONS BASED ON DOSE CALCULATED FROM RELEASE DATA

- 3.1.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.2):

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\_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_.

- 3.1.2 Enter ID and Password.

- 3.1.3 If both the meteorological tower and the station vent monitor are operable, follow the steps in Exhibit 4.4.9-A.

- 3.1.4 If a source term and/or meteorological conditions have been provided (as in an exercise or test of the Plan), follow the steps in Attachment 2 for a quick dose estimate. Step 3.3 of this procedure (DAC Calculation) provides a better (more accurate) calculation, and should be used after the initial assessment has been performed.

- 3.1.5 ERPIP 4.4.1 provides rapid procedures for estimating either the source term or the meteorological conditions, if normally available instrumentation is out of service.

### 3.2 COMPUTER CALCULATED ISOPLETHS

Note: DAC is capable of calculating simple isopleths such as those used on the board-mounted 10 and 50 mile maps. It is also capable of accounting for more complex meteorological effects such as plume rise, terrain effects and shifts in wind direction. It is recommended that before offsite emergency actions are initiated that comparisons be made (if practicable) between DAC estimated isopleths and those predrawn isopleths used on the board-mounted maps.

- 3.2.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.2):

Ch.1

\_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_.

- 3.2.2 Enter ID and Password.

3.2.3 Follow the steps set forth in Attachment 3. This will generate isopleths analogous to the predrawn isopleths used in ERPIP 4.4.2.

3.2.4 If more complex calculations are required, obtain specialists knowledgeable in the use of the DAC (Appendix A.2)

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### 3.3 BEST ESTIMATE DETERMINATION OF PROJECTED DOSES

Note: Procedure 3.1 assumes for purposes of an initial calculation that the relative abundances of release isotopes remains with time. The detector response will vary with changing isotopic mixtures. This procedure accounts for that effect. Further, if vent radiation monitors are inoperable or off-scale, it will be necessary to obtain estimates of the source term from other inputs (See ERPIP 4.4.3).

3.3.1 Using the phone at the computer console, access the DAC by dialing any of the following 1200 BAUD numbers(See Appendix A.2):

Ch.1

\_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_.

3.3.2 Enter ID and Password.

3.3.3 If the release is from the main vent and is being monitored by the main vent monitor proceed to Attachment 4 and follow steps listed.

3.3.4 If the release is from the main vent and is being measured by any one of the monitors in ERPIP 4.4.3 Exhibit 4.4.3-C, Part C, note the ventilation flow rate from that area and the monitor reading and use these as inputs to Attachment 5.

3.3.5 If release rates must be inferred from plant measurements such as RCS activity levels, or if release rates are to be determined based on estimated fuel failures and RCS leakage rates, follow the steps in Attachment 5.

3.3.6 If a release rate has been estimated from ERPIP 4.4.7 or from Appendix C.1, use that value as input to Attachment 5.

#### 3.3.7 DOSES BASED ON ACCIDENT TYPE ONLY

Note: There may be a need to develop a preliminary perspective on the consequences of an accident, in advance of analyses of the source term. It may also be useful to compare actual estimates with pre-accident estimates. This is included as Release Option 4 of Attachment 3. To perform this calculation follow the steps in Attachment 5.

3.3.8 If the user wishes to input both release data and meteorological data, follow the steps in Attachment 6 (in lieu of Attachment 5).



### 3.4 MODIFYING OF ESTIMATED RELEASES BASED ON FIELD DATA

Notes Any estimates based on plant measurements are subject to uncertainty. There may be systematic errors in instrument calibration, deviations from actual dispersion versus that computed, etc.

3.4.1 Obtain field measured dose rates corresponding to the maximum (peak center line) dose rates at that distance.

3.4.2 Obtain estimates of dose rates from 3.1 or 3.3 of this ERPIP, corresponding to the locations of field measurements.

Notes If the field measurements do not correspond to estimated peak center line dose rates, either (1) develop an estimated center line concentration, using the methods outlined in Appendix C.2, or (2) compare the field measured data directly with a DAC calculated dose rates isopleth corresponding to the location of interest.

3.4.3 Divide the values in 3.4.2 by the corresponding values in 3.4.1. These constitute correction factors which may be used as standard correction factors in the projection of doses. Separate correction factors for gamma dose and iodine concentration are entered via the menu lines 14 and 15, respectively.

### 3.5 ESTIMATING OFFSITE CONSEQUENCES BASED ON INPLANT RADIATION LEVELS

3.5.1 If estimates are available in terms of isotopic activity in the RCS or in containment atmosphere (from direct samples or from analyses - as from ERPIP 4.4.7 or Appendix C.1, Table C.1.1-II, page C.1-14), convert those values into a "leak rate" as follows:

#### Containment Atmosphere Activity

Containment air activity (uCi/cc)  $\times 3 \times 10^3 \times$  percent per day leak rate = uCi/sec released.

#### Reactor Coolant Activity

##### o Noble Gases

RCS activity in uCi/ml  $\times$  gpm leaked ex-containment  $\div 63$  = uCi/s released.

o Halogens - steam line break or steam generator tube rupture RCS  
(uCi/ml)  $\times$  gpm leaked ex-containment  $\times 6.3$  = uCi/s released.

## 3

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TITLE: ONSITE ADMINISTRATION OF RADIOPROTECTIVE DRUGS

1.0 RESPONSIBLE INDIVIDUAL

- 1.1 The Radiation Protection Director and/or Radiological Assessment Director are responsible to evaluate need for administration of radioprotective drugs to "high risk" onsite emergency personnel.
- 1.2 The Calvert Cliffs Physician Assistant or the Plant Health Physicist is responsible for dispensing the radioprotective drugs for use in an emergency.

2.0 CONDITIONS AND PREREQUISITES

A release of gaseous radioactive materials from which any onsite individual is expected to receive thyroid dose greater than 0.9 rem (40 MPC-h for

$\Sigma$   $\left( \begin{array}{l} \text{Clodine} \\ \text{MPClodine} \end{array} \right)$  from airborne radioiodine.

3.0 ACTIONS AND LIMITATIONS

-NOTE-

If the nature of the gaseous release indicates the potential for significant levels of iodine consider immediate administration of radioprotective drugs to Offsite Monitoring Teams prior to survey initiation.

- 3.1 Remove personnel from areas of high radioiodine concentration (as advisable considering personnel and plant safety) and/or consider making stable iodine as a thyroid blocking agent available for proper administration.
- 3.2 If a thyroid blocking agent is to be administered, assure that single doses consisting of: (1st Priority) 2 or 3 drops (or 100 mg) of Saturated Solution of Potassium Iodide (SSKI) in a glass of water, or (2nd Priority) 1 tablet (130 mg) are administered to affected individuals as soon as possible.

-NOTE-

Administration of SSKI is preferably done within two hours of exposure; however, if this time is impractical, administration beyond two hours will still reduce the biological half life of the radioiodine. Approximately 300 doses of SSKI are located in the Controlled Area First Aid Room at El.69' of the Auxiliary Building. Approximately 5000 doses are located in the Service Building Medical Office.

- 3.3 Consult the BG&E Medical Director (phone no. in Appendix A.2) for continued or subsequent usage of KI.

Ch.1

DATE: November 11, 1981

## RADIOPROTECTIVE DRUG ADMINISTRATION RECORD

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DISPENSED BY: (Signature)



ERPIP 4.5.4.1 REVIEW/APPROVAL

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-NOTE-

Treatment for trauma and shock, hemorrhage, and embarrassment of respiration always takes precedence over decontamination procedures and treatment of possible symptoms from irradiation.

3.4 Implement Steps 3.4.1, 3.4.2, 3.4.3, or 3.4.4 based upon the specific class of injury:

3.4.1 Minor, contaminated injuries

3.4.1.1 Attempt decontamination by removing all loose contaminated clothing and washing contaminated body surfaces with soap and water. Refer to RSP-1-107 for additional standard practices.

-NOTE-

Use providine surgical scrub for decontamination of skin that is radioiodine contaminated.

3.4.1.2 If decontamination is successful, transport personnel to First Aid Room for further medical treatment.

Personnel Transported:

Initials / Time

3.4.1.3 If decontamination is unsuccessful, notify the BG&E Company Medical Department (See Appendix A.2).

BG&E Co. Medical Dept. Notified:

Initials / Time

Ch. 1

3.4.2 Serious, contaminated injuries

Start decontamination by the steps described in 3.4.1 as the situation permits. Provide assistance to the Shift Supervisor and EFADT Leader as necessary to:

- 1) Provide notification to Calvert Memorial Hospital.
- 2) Continue treatment onsite.
- 3) Summon Radiation Management Corporation for assistance and transportation to Calvert Memorial Hospital.
- 4) Expedite the arrival of BG&E physician.

3.4.3 External radiation exposure with injury, with contamination

Perform decontamination in accordance with Step 3.4.1 and refer to Step 3.4.4 as necessary.

3.4.4 External radiation exposure without injury, with contamination

Perform decontamination in accordance with Step 3.4.1 and assist the EFADT Leader and Shift Supervisor as necessary to:

- 1) Notify the BG&E Medical Department for assistance on site.
- 2) Notify Radiation Management Corporation to standby for eventual assistance.

-NOTE-

1. Refer to ERPIP 4.6.4 for guidance in initial management of irradiated or radioactively contaminated personnel.
2. If the dose to the patient is most likely to be below 10 rads, further action will be determined by the BG&E Medical Director and patient's family physician. If the dose to patient is greater than 10 rads but less than 100 rads, the BG&E Medical Director will consult with RMC to determine whether and where observation and/or treatment shall be performed.
3. Physician Assistant or Plant Health Physicist collect blood sample for cytogenic analysis. Use RMC Sample Collection Kit located in the Controlled Area Medical Treatment Room or at the Farm Demo Building.

ERPIP 4.5.5 REVIEW/APPROVAL

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TITLE: HEALTH PHYSICS ASSISTANCE AT CALVERT MEMORIAL HOSPITAL

1.0 RESPONSIBLE INDIVIDUAL

The assigned First Aid Team member or Rad-Chem Technician is responsible for implementing this procedure until relieved by the Plant Health Physicist or other company or consultant professional health physicist.

2.0 CONDITIONS AND PREREQUISITES

Upon patient transfer to hospital when required by ERPIP 3.1 or 4.6.2.

Ch. 2

3.0 ACTIONS AND LIMITATIONS

- 3.1 Ensure Radiation Emergency Area (REA) entrance has been properly activated, posted, and guarded.

REA Activated:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- 3.2 Direct ambulance/transportation personnel to remain with transport vehicle until cleared by Plant Health Physicist or his designee.

Personnel Directed:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- 3.3 Escort patient to REA entrance area.

- 3.4 Inform attending physician of patient's radiation and medical status (refer to EXHIBITS 4.6.2-A and 4.6.2-B) and any radiological hazards that may be encountered.

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- 3.5 Don CMH supplied anti-C clothing and enter REA to ensure the following actions have been previously performed.

- (1) Hospital Staff wearing anti-Cs:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time

- (2) Wearing TLDs and SRDs:

\_\_\_\_\_/\_\_\_\_\_  
Initials Time



- (3) Step-Off-Pad Areas Set-Up with Friskers:

          /            
Initials      Time

- (4) Waste containers properly set-up

          /            
Initials      Time

- 3.6 Consult with attending physician concerning definitive evaluation and care of the patient.

-NOTE-

Emphasis should be on assisting the physician and making recommendations with regard to contamination of the patient and radiological hazard. Contaminated wound decontamination requires close cooperation between the surgeon and the Radiation Safety Technician. The physician will make all treatment decisions.

- 3.7 Monitor all tissue specimens for residual contamination.  
3.8 Assist in the decontamination of the patient when treatment of injury permits as determined by attending physician.  
3.9 Monitor patient periodically to determine effectiveness of medical decontamination and inform physician of the success of the decontamination performed.

-NOTE-

Recommend need to continue or discontinue decontamination efforts.

Recommendation Made (circle one):

Continue  
Discontinue

          /            
Initials      Time

- 3.10 Save and label all specimens of urine, vomitus, feces, blood, tissue and metals from the patient until their use in radiation evaluation has been completed.  
3.11 Supervise and regulate protection of personnel entering or exiting from the area.  
3.12 Maintain adequate traffic control of all equipment entering or exiting from the area.  
3.13 Subsequent Actions - - after the injured individual has been suitably decontaminated and removed from the REA perform the following actions:  
3.13.1 Collect pocket dosimeters; monitor and evaluate personnel exposure upon completion of emergency:

ERPIP 4.6.3 REVIEW/APPROVAL

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Medical Treatment Room or hospital, as may be indicated. Provided it is deemed necessary by the cognizant physician, contact a professional Health Physicist and/or radiation medical specialist, as soon as possible, for assistance. When the patient is out of danger from traumatic injuries and requires no further urgent medical treatment, proceed as outlined under steps 4.1.2 and 4.1.4 below.

- 4.1.2 Step 2. Initial Contamination Control. Without hindering necessary therapy, monitor the patient to evaluate the degree of external and internal contamination, and determine if external exposure to radiation has occurred. Take all reasonable measures to prevent spread of contamination if it exists; e.g. wrap contaminated patient in blankets, or cotton or plastic sheets. When using plastic sheets, care should be taken to prevent heat prostration of the patient. Under no circumstances should any patient be denied access to necessary therapy or medical facilities because of contamination. Conversely, careful planning should be carried out and a place set aside to decontaminate patients. This can be done inexpensively, and will avoid unnecessary contamination of hospital facilities from radioactivity on patients who may be in need of only minimal or no medical care. Determining level and extent of contamination will allow systematic approaches to preventing its spread and to its removal while necessary therapy is accomplished.

4.1.3 Step 3. Radiological Evaluation

- (1) From the history, account of the incident or accident, the reading of monitoring devices, etc., it should be possible to evaluate the potential seriousness of the situation in a short period of time. If the cognizant physician deems it necessary, a Health Physicist and/or radiation medical specialist should be contacted immediately to assist in a comprehensive evaluation of the radiological status. Every effort should be made as soon as feasible to estimate the doses to the applicable part of the body using guidance provided in F/A training.
- (2) Under some conditions it may be difficult to distinguish quickly

between externally deposited contamination and internal contamination. However, the history, and distribution of contamination on the skin and clothes, should allow an early assessment. On the basis of the radiological evaluation, either return the patient to work, or proceed with decontamination, interim care, or therapy in consultation with radiological evaluation and radiation medical specialists. If, in the course of the radiological evaluation, it becomes apparent that excessive radiation exposure or contamination has occurred, make every effort to contact the BG&E Medical Director and recommend that a medical specialist at the Radiation Management Corporation in Philadelphia (Appendix A.2) be contacted.

Ch.1

- (3) In the interim, before a specialist arrives, proceed as follows:
- (4) Interim Care The following procedures are intended only as a general guidance to be employed until definitive care may be undertaken in consultation with a radiation medical specialist.
  - (a) Decontamination of Skin and Hair. Follow instructions in ERPIP 4.5.5 or RCP 3-606.
  - (b) Internal Decontamination. For inhalation or ingestion, proceed as described in RCP 3-606 to the extent warranted by the circumstances. The presence of radioactivity in or on the body rarely constitutes an acute hazard. However, its removal constitutes good hygiene. Frequently, prompt action will permit removal of most of the radioactive material, and thus reduce the amount of retained activity and exposure.
  - (c) Contamination of the Eyes, Ears, Sinus. Mild lavage fluids should be used with periodic monitoring of the organ(s) and washing to determine the effectiveness of the procedures. Should these efforts fail, and ophthalmologist and/or otolaryngologist must be consulted. "Hot particles" that are essentially point



sources can deliver a high dose rate to the tissue in juxtaposition to the particle; thus there is no justification for leaving significant quantities of radioactivity on external surfaces of the eye or ear. In attempting to remove radioactivity within the eye or ear that is not easily accessible, hazardous procedures would be warranted only if relatively large amounts of insoluble radioactive material were involved.

-NOTE-

Of importance is the fact that radioactive particles likely to be encountered have a high probability of containing magnetic materials; thus magnetic techniques may be applicable to their removal.

- (d) Wound Decontamination. Proceed as indicated in sections ERPIP 4.5.5 or RCP 3-606. With rare exception, contamination of wounds does not in itself constitute an acute medical emergency. However, there may be long-term consequences. Therefore, in all cases reasonable efforts should be made to remove contamination before definitive surgical treatment. Obtain the help of radiological evaluation and radiation medical specialists if required (Appendix A.2 RMC). | Ch.1
- (e) Heavy External Exposure. Heavy external exposure does not present a medical emergency. The medical outcome, including survival, does not depend critically on procedures performed during the first few hours after exposure. There is time for evaluation, which must be done in conjunction with a professional Health Physicist. A brief description of the signs and systems of heavy external exposure is given in ERPIP 4.6.1. | Ch.1
- (5) Problems of Psychological Upset. Because of the unusual nature of ionizing radiation, apprehension and frequently unreasonable fear may accompany exposure. Every effort to reassure the patient and to allay his fears should be made.



Under no circumstances is the patient's survival in question unless (a) the exposure is to the entire body, and the dose exceeds approximately 200 rads, or (b) the exposure is to some large segment of the body such as the head or thoracic area, and the dose is of the order of several hundred to thousands of rads. No industrial radiation accident patient has ever developed early signs and symptoms of radiation sickness (other than psychosomatic) as a result of exposure from contamination of the skin or internal organs.

ERPIP 4.6.4 REVIEW/APPROVAL

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October 20, 1983

TO: ERPIP Holders  
FROM: T. E. Forgette  
SUBJECT: Removal of Cancellation Letters


This letter authorizes removal of cancellation letters for the following ERPIP's:

4.2, Notification  
4.5.1.1, Alert: Protection, Accountability, & Evaluation  
4.5.1.2, Site Emergency: Protection, Accountability & Evacuation  
4.5.1.3, General Emergency: Protection, Accountability & Evacuation  
4.10, Emergency Security  
Appendix A.3.1, B, G, & E Emergency Communications  
Appendix A.3.2, Offsite (Non-BG&E) Emergency Communications  
Appendix A.4, Police, Fire & Medical Emergency Telephone Numbers  
Appendix A.5, Federal, State and County Agencies.  
Appendix D.1, Response to Alarms  
Appendix D.2, Arrest and Detention  
Appendix D.3, Site Traffic Control

All references to these procedures have been deleted.

  
\_\_\_\_\_  
Supervisor-Emergency Planning

83-128  
PCSRC

  
\_\_\_\_\_  
Plant Superintendent

TEF/CLR/ldt