

[COPY NUMBER:

ATTACHMENT A

MAINE YANKEE CONTROLLED DOCUMENT TRANSMITTAL FORM

DOCUMENT: 2.50 - DEFUELED E-PLAN IMPLEMENTING PROCEDURES

TRANSMITTAL ISSUE DATE: 1-27-00 TRANSMITTAL RETURN DATE*: 2-25-00

1. Please remove existing page 1 of the 2-50 Series Index, DEFUELED EMERGENCY PLAN IMPLEMENTING ISR PROCEDURES, and replace with the attached page 1, dated 01-20-00. This is a corrected index.
2. Please remove existing Proc. No. 2-50-5, RADIOLOGICAL ASSESSMENT COORDINATOR ACTIONS AND DOSE PROJECTIONS, Rev. No. 3, and replace with the attached Proc. No. 2-50-5, (SAME TITLE), Rev. No. 2. This procedure was inadvertently issued prematurely.

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DEFUELED EMERGENCY PLAN IMPLEMENTING ISR PROCEDURES INDEX

01-20-00
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2-50-1	EMERGENCY DIRECTOR	1	02/99	02/2001
2-50-2	OPERATIONS COORDINATOR	1	02/99	09/2000
2-50-3	TECHNICAL RESPONSE COORDINATOR ACTIONS	1	01/00	09/2000
2-50-4	DAMAGE CONTROL COORDINATOR ACTIONS	2	02/99	09/2000
2-50-5	RADIOLOGICAL ASSESSMENT COORDINATOR ACTIONS and DOSE PROJECTIONS	2	6/99	09/2000
2-50-6	RADIOLOGICAL ASSESSMENT and MONITORING	1	11/99	09/2000
2-50-7	EMERGENCY SECURITY ACTIONS	2	12/99	09/2000
2-50-8	MEDICAL EMERGENCY RESPONSE	2	02/99	09/2000
2-50-9	PUBLIC AFFAIRS COORDINATOR	2	11/99	12/2000
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Procedure Title: RADIOLOGICAL ASSESSMENT COORDINATOR ACTIONS and DOSE PROJECTIONS	Proc. No. 2-50-5 Class ISR Rev. No. 2 Issue Date: 06-14-99 Review Date: 09/2000 Page 1 of 19
APPROVED BY ISR: <i>P. Newcomb</i>	
DATE: <i>6/10/99</i>	

1.0 OBJECTIVE

This procedure provides instructions and guidance to perform dose projections and to coordinate the response to a radiological or hazardous material event, including habitability, hazard assessment and Damage Control Team support.

2.0 DISCUSSION

In the event of a radiological emergency involving a release of radioactive material, trained personnel perform dose projections and radiological field measurements that, in part, form the basis for protective action recommendations for plant staff. Survey teams collect and transmit measurements of radiological data to the Technical Support Center (TSC) as necessary. This data is compared to dose projections which are based on source term evaluations and effluent monitor responses.

10 CFR 50, Appendix E (IV) (B) requires licensees to maintain and describe in their plans and procedures "The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials . . ." Shift Managers are responsible for performing dose projections and implementing onsite protective measures until relieved by the oncoming ED.

The Radiological Assessment Coordinator (RAC) ensures that potentially hazardous conditions (radiological or hazardous materials) are monitored and an assessment of the impact on station personnel is conducted. The results of these assessments are used to develop protective action measures for on-site activities. The RAC has discretionary authority regarding implementing habitability and dosimetry constraints within the TSC, based on the event in progress.

The RAC determines the types of assessment to be conducted, assigning staff to perform radiological surveys if a release of radioactive materials occurs, initiating radiological dose projections and advising Damage Control personnel of known hazards and associated risks. If necessary, the RAC approves emergency exposure limits. The RAC reports to the Emergency Director.

3.0 RESPONSIBILITIES

- 3.1 The Shift Manager is responsible for performing dose projections and implementing onsite protective actions until relieved by the oncoming Emergency Director.
- 3.2 The RAC is responsible for implementing this procedure. In the absence of the RAC, the Operations Coordinator is responsible for implementing this procedure.

4.0 PRECAUTIONS

None

INITIAL/TIME

5.0 PREREQUISITES

5.1 The Emergency Response Organization has been activated.

6.0 PROCEDURE

[6.1 SHIFT MANAGER INITIAL ACTIONS

[6.1.1 IF a release of radiation is in progress or expected, THEN perform dose
[projections IAW Steps 6.4.1 and 6.4.2, and then develop and implement
[any onsite protective actions. (CRS-6). _____ /

[6.2 TSC INITIAL ACTIONS

6.2.1 Verify persons are responding or have been assigned to perform the
following functions, as needed:

a. Radiological Event _____ /

- Dose Projections
- Radiological Monitoring Activities (in plant, onsite, vehicles and
equipment, environmental sampling)
- RP Tech Coverage
- TSC Habitability
- Dosimetry
- Print Respirator Report (Menu Option RPR9) from Health Physics
Information System (HIS)

b. Non-Radiological Event

- Environmental Specialist/EHS Staff
- HAZMAT Coordinator
- Qualified monitoring staff
- TSC Habitability
- Print Respirator Report (Menu Option RPR9) from Health Physics
Information System (HIS)

6.2.2 Review plant conditions (discuss with Operations Coordinator or review
available status reports). _____ /

6.2.3 Notify the Emergency Director when the Rad Assessment staff are able to
support emergency response functions. _____ /

6.2.4 If deemed necessary, announce there shall be no eating or drinking in the
emergency center until habitability has been verified (use either the
FEMCO or the paging function of the telephone system). (CRS-1) (N/A) _____ /

6.2.5 If deemed necessary, assign an RP Technician to perform habitability
surveys in the TSC and adjacent areas being used by the ERO. (REFER
TO ATTACHMENT E of Procedure 2-50-6, RADIOLOGICAL
ASSESSMENT AND MONITORING)

RC Tech assigned _____ (N/A) _____ /

6.2.6 IF habitability is verified, THEN announce that habitability in the TSC has
been verified and eating and drinking are permitted, flip the yellow
habitability placard on the TSC status board to display status. (N/A) _____ /

INITIAL/TIME

- 6.2.7 If deemed necessary, ensure that all TSC personnel have, or are being issued, dosimetry. (N/A) _____ / _____
- 6.2.8 IF electronic dosimetry IS NOT being used for dose/job tracking THEN obtain a copy of the Personnel Exposure Information Report (PERER #4) for job planning reference. (N/A) _____ / _____
- 6.2.9 IF plant access is shifted to the tunnel, THEN assign an RP Technician to coordinate with Security to establish a Checkpoint at the Staff Building tunnel entrance. (N/A) _____ / _____

RP Tech assigned: _____

6.3 IN-PLANT/ON-SITE RADIOLOGICAL/HAZARD STATUS REVIEW

- 6.3.1 As necessary, assign available qualified staff to conduct radiological/hazard surveys IAW Procedure 2-50-6, RADIOLOGICAL ASSESSMENT AND MONITORING. Update the TSC Site Survey Map for use in preparation for briefing Damage Control Team activities. _____ / _____
- 6.3.2 Coordinate survey team activities.
- a. Use the E-Plan base radio in the TSC.
 - b. Request teams use Frequency 1 (Operations) to communicate with the TSC.
 - c. Record survey data from the survey teams on Attachment E, SURVEY DATA (Radio user's manual is located in the TSC Radio Cubicle). _____ / _____
- 6.3.3 Periodically review on-going activities with assembled RAC Staff
- 6.3.4 Periodically confer with the Damage Control Coordinator to ensure staffing needs are identified to support Damage Control/repair activities.
- 6.3.5 IF abnormal radiation levels are noted, THEN record RMS values on Attachment D, RMS DATA SHEET. These readings should be used in preparation for briefing Damage Control Team activities.
- 6.3.6 Regularly brief the Emergency Director on the status of radiological monitoring and dose projections.

6.4 DOSE ASSESSMENT

NOTE

Dose projections should be performed BEFORE a release occurs, if possible, based on available source term information and then modified if a release occurs using actual release parameters.

- 6.4.1 IF a release has occurred, is anticipated or is in progress, THEN perform dose projections per Attachment H, DOSE PROJECTION. (N/A) _____ / _____

INITIAL/TIME

6.4.2 Compare dose projection results with the following to identify any discrepancies.

_____/_____
/

- a. Radiation monitor readings and plant status;
- b. In-plant/on-site radiological surveys;

6.4.3 Review and approve dose projections and submit to the Emergency Director for approval. (CRS-2)

_____/_____
/

6.4.4 Review Emergency Action Levels contained in Section 3 of Attachment A of Procedure 2-50-0, EMERGENCY CLASSIFICATION, NOTIFICATION, AND ERO ACTIVATION, and make recommendations regarding event classification to the Operations Coordinator. (CRS-4)

_____/_____
/

6.4.5 Record Dose Projection results on Attachment I, DOSE PROJECTION TREND LOG.

_____/_____
/

6.4.6 Copy and distribute approved dose projection results to TSC Staff.

6.4.7 Continue evaluating dose projections as necessary.

6.5 ON-SITE PROTECTIVE ACTION RECOMMENDATIONS

6.5.1 IF results of a habitability survey indicates that the TSC or adjacent areas may not be habitable, THEN:

- a. REFER TO Attachment A, ON-SITE PROTECTIVE ACTIONS to determine if protective actions should be recommended for the TSC.
- b. Review recommended protective measures with the Emergency Director and Operations Coordinator.

6.5.2 Ensure approved on-site protective measures are implemented.

- a. Direct any measures for Security Officers on outside patrol, or on other outside assignments to the Security Coordinator. (N/A)

_____/_____
/

6.5.3 Direct RAC/RP staff to increase the frequency of habitability surveys, if warranted. (N/A)

_____/_____
/

6.6 PERSONNEL/EQUIPMENT CONTAMINATION

6.6.1 Report personnel and equipment contamination issues to the Emergency Director.

6.6.2 Decontaminate personnel and equipment using established radiological procedures and in-plant facilities (A decon footlocker is maintained in Room 116 of the Staff Building).

6.6.3 IF decontamination using normal plant facilities cannot be performed due to the hazardous conditions, THEN decontaminate personnel in the first floor shower facilities using supplies stored in Room 116.

INITIAL/TIME

6.7 EMERGENCY EXPOSURE CONTROL

NOTE

Normal administrative limits apply IAW Procedure 6.2.2, DOSE EXTENSIONS, until emergency exposures are approved.

6.7.1 IF a request for emergency exposure authorization is received from the Damage Control Coordinator (DCC), THEN:

- a. Verify that Attachment B, EMERGENCY EXPOSURE PLANNING GUIDELINES, have been met. _____ /
- b. If appropriate, authorize the emergency exposure. REFER TO Attachment B of Procedure 2-50-4, DAMAGE CONTROL TEAM BRIEFING/DEBRIEFING CHECKLIST. _____ /
- c. Review the exposure authorization with the Emergency Director. _____ /

6.7.2 Record personnel exposure information on Attachment C, PERSONNEL EXPOSURE LOG, or similar log. (CRS-5)

6.8 DUKE ENGINEERING & SERVICES (DE&S) SUPPORT

6.8.1 Coordinate requests for DE&S support (source term, dose projection, TLD, whole body counting, environmental sampling or sample analysis assistance) with the TRC (CRS-3).

6.8.2 Contact DE&S Radiological Engineering Representative for periodic updates on meteorological forecasts, as necessary.

6.9 ENVIRONMENTAL SAMPLING

6.9.1 WHEN the plume has dispersed, THEN:

- a. Direct Environmental Monitoring staff to collect the filter media and the TLDs at the environmental sample stations for analysis. _____ /
- b. Coordinate with the Environmental Monitoring staff or DE&S personnel on collection of soil, vegetation, water, snow, and milk samples in the path the plume traveled. _____ /
 - 1) Ensure Environmental Monitoring staff/teams have Attachment D, ENVIRONMENTAL SAMPLING GUIDELINES and Attachment E, DATA REDUCTION SHEET of Procedure 2-50-6 RADIOLOGICAL ASSESSMENT AND MONITORING. In addition, ensure they have copies of Procedures 26-316-1, EFFLUENT MONITORING PROGRAM, 26-316-2, INGESTION PATHWAY ENVIRONMENTAL MONITORING and 26-316-4, ENVIRONMENTAL TLD PROGRAM. _____ /

7.0 FINAL CONDITIONS

- 7.1 The emergency is terminated and emergency centers are secured.
- 7.2 Dose Projections have been completed and reflect current or bounding conditions.

8.0 REFERENCES

8.1 SOURCES

- 8.1.1 USNRC I E Notice 84-40 - Emergency Worker Doses
- 8.1.2 DE & S Calculation MYC-2039 "FUEL HANDLING ACCIDENT SITE BOUNDARY DOSE RATES VERSUS SPENT FUEL POOL EXHAUST VENTILATION MONITOR RESPONSES" (9/3/98)
- 8.1.3 EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", October, 1991

8.2 COMMITMENTS

- 8.2.1 CRS-1, CMS 25-15-11
- 8.2.2 CRS-2, CATS 92-04-08
- 8.2.3 CRS-3, CATS 92-06-26
- 8.2.4 CRS-4, CATS 98-06-32 (EAL References)
- 8.2.5 CRS-5, CATS 98-06-43 (Dosimetry Log Use)
- [8.2.6 CRS-6, Drill Open Item 99-04-05 (Direct Shift Manager to use Attachment H)

ATTACHMENT A (Sheet 1 of 2)
ON-SITE PROTECTIVE ACTIONS

RADIOLOGICAL CONDITION	RECOMMENDED PROTECTIVE ACTION
<p>1. <u>Deep Dose Equivalent (DDE)</u> <u>DOSE/DOSE RATE</u></p> <p>Greater than 5 mR/hr.</p> <p>Greater than 1 Rem on emergency center high range dosimeter.</p> <p>Individual exceeding 4 Rem</p> <p>Greater than 4 Rem on emergency center high range dosimeter.</p>	<p>Increase frequency of radiation monitoring. Frequent evaluation of center high range dosimeter. Increase frequency of checking personnel dosimeters. Avoid radiation streaming areas. Identify and utilize low background areas.</p> <p>Recommend center evacuation planning be initiated. Evaluate if center evacuation is necessary based on dose rates outside the facility. Also consider the pace of the accident scenario, dose rate trends and time to termination of the release. This could affect the ability to safely evacuate by the time the inside integrated dose reached 4R.</p> <p>Individuals that have received 4 Rem during the course of the accident should be relieved of their emergency duties and sent home.</p> <p>Recommend a phased center evacuation be initiated.</p>
<p>2. <u>Thyroid Committed Dose Equivalent (CDE)</u></p> <p>Any positive indication of iodine airborne concentration.</p>	<p>Increase frequency of sample analysis to monitor need to administer KI.</p>
<p>3. <u>Airborne Particulate Concentration</u></p> <p>Greater than 1E-7 unidentified (1000 DAC)</p>	<p>Recommend a phased center evacuation be considered.</p>
<p>4. <u>Contamination</u></p> <p>Greater than 1000 dpm/100 cm² (beta, gamma) or 100 dpm/100 cm² (alpha)</p>	<p>Recommend full protective clothing for emergency center personnel.</p>

ATTACHMENT A (Sheet 2 of 2)
ON-SITE PROTECTIVE ACTIONS

<u>AREA</u>	<u>PROTECTIVE ACTION RECOMMENDED</u>	<u>IMPLEMENTED/TIME</u>
In-Plant		
• Turbine Hall	_____	_____ / _____
• PAB	_____	_____ / _____
• Containment	_____	_____ / _____
• Spray Building	_____	_____ / _____
• Spent Fuel Building	_____	_____ / _____
• Other	_____	_____ / _____
On-Site		
• Survey Teams	_____	_____ / _____
• Warehouse	_____	_____ / _____
• Career Center	_____	_____ / _____
• Security	_____	_____ / _____
Staff Building		
• TSC	_____	_____ / _____
• General	_____	_____ / _____

Prepared by: _____ / _____
Radiological Assessment Staff Member/SM

Approved by: _____ / _____
Radiological Assessment Coord./SM

Reviewed by: _____ / _____
Operations Coordinator

Copies to: Emergency Director
Technical Response Coordinator
Damage Control Coordinator
Radiological Assessment Staff

ATTACHMENT B

EMERGENCY EXPOSURE PLANNING GUIDELINES

The following guidelines should be used when planning exposures in excess of normal administrative limits.

1. The risk of not performing the task has been evaluated against the anticipated exposure.
2. Persons performing the planned actions are volunteers broadly familiar with the consequences of exposure.
3. For a lifesaving mission, volunteers above the age of 45 have been selected, considering other factors such as experience and qualifications as being equal.
4. Declared pregnant women should not take part in the planned activities.
5. Every reasonable effort is taken to keep emergency exposures ALARA (such as use of protective clothing and respiratory protection).
6. Dosimetry equipment capable of measuring the anticipated maximum exposure and type of radiation is to be worn by personnel receiving emergency exposures.
7. The anticipated emergency exposures are within the limits given below:

TYPE OF ACTIVITY	TEDE*	CONDITION
All, except as noted below.	5 Rem	Maintain ALARA and to extent practicable limit emergency workers to these limits
Protecting valuable property	10 Rem	Lower dose not practicable
Life Saving or Protection of Large Populations	25 Rem	Lower dose not practicable
Life Saving or Protection of Large Populations	> 25 Rem	Only on a voluntary basis to persons fully aware of risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of delayed effects.

* Sum of the deep dose equivalent from the external sources and the committed dose equivalent from internal exposures to nonpregnant adults from exposure and intake during an emergency situation.

Dose limits to the eye should be 3 times the listed TEDE value.

Dose limits to any individual organ (including skin and body extremities) should be 10 times the listed TEDE value.

ATTACHMENT E

**SURVEY DATA SHEET
 SURVEY RECORD**

Survey Team Color (circle one): Red Blue

Sample # _____ (Start with Team color and sequential order of sample, Red-1, etc.)

Sample time (24 hr clock)	1		AIR SAMPLE COUNTING	
Sample Location	2		Background count (w/pancake probe in sample holder)	10 (cpm)
Approximate distance from plant	3	(miles)	Total Particulate filter count rate	11 (cpm)
BETA/GAMMA SURVEY Indicate Instrument Type			Net particulate filter count (part.-bkg.)	(cpm)
At waist level - window closed	4	(mR/hr)	Particulate concentration (from Attachment F)	(μ Ci/cc)
At waist level - window open	5	(mR/hr)		
2" above ground - window open	6	(mR/hr)	KRYPTON-85 SAMPLE RESULTS	Sample collected with AMS-3
AIR SAMPLE			Total AMS-3 Count Rate	12 (cpm)
Sample start time	7		Kr-85 Activity Concentration (from Attachment G)	(μ Ci/cc)
Sample flow rate	8	(cfm)	Kr-85 Skin Dose (from Attachment G)	(mR/hr)
Sample elapsed time	9	(min)		

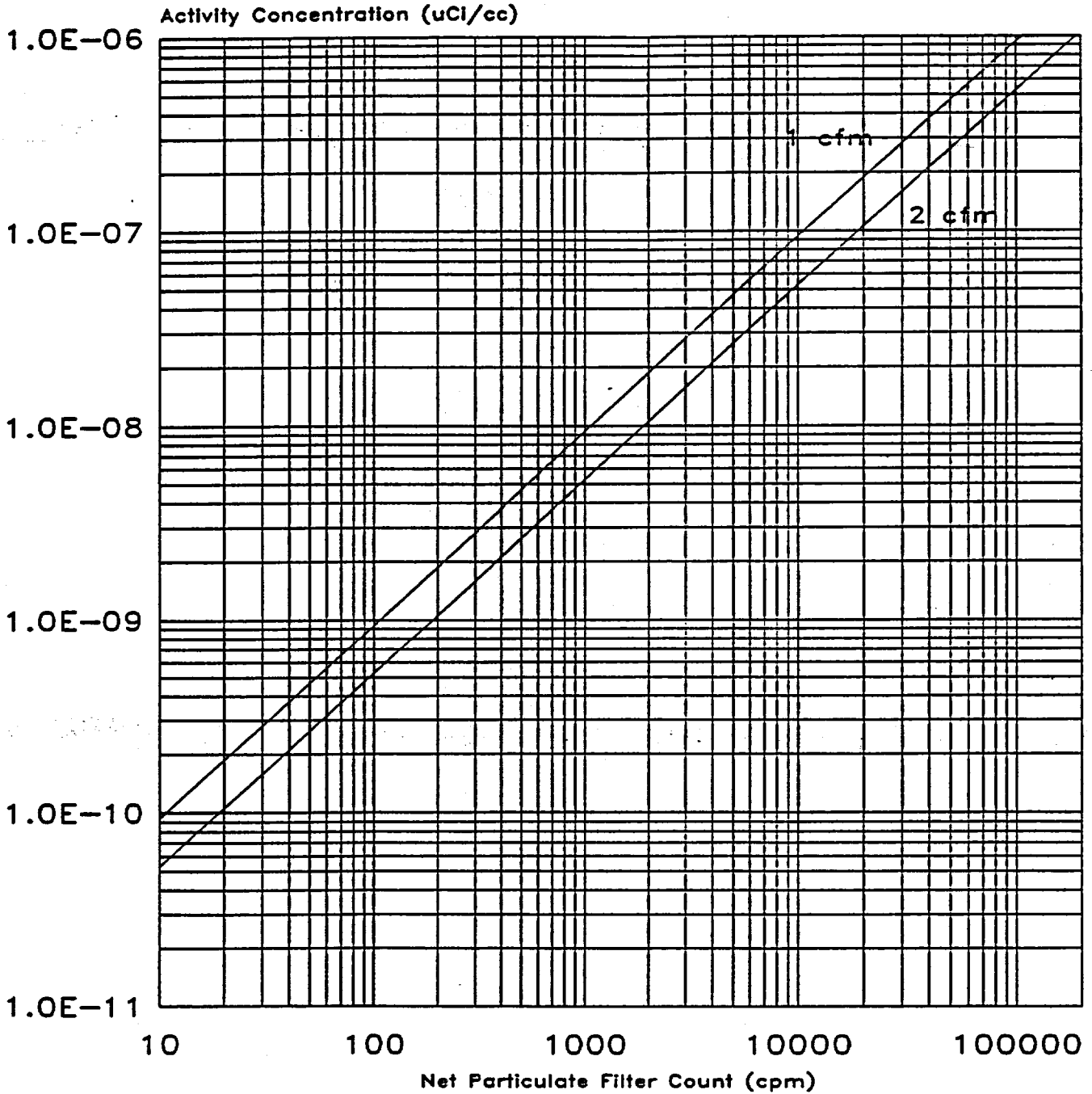
Prepared by: _____ / _____
 Field Team Coordinator (designated) Date Time

Reviewed by: _____ / _____
 Rad Assessment Coordinator Date Time

Routing: Make copies for Emergency Director, State Rep., TSC Status Board, Rad. Assessment Coordinator and RA Staff.

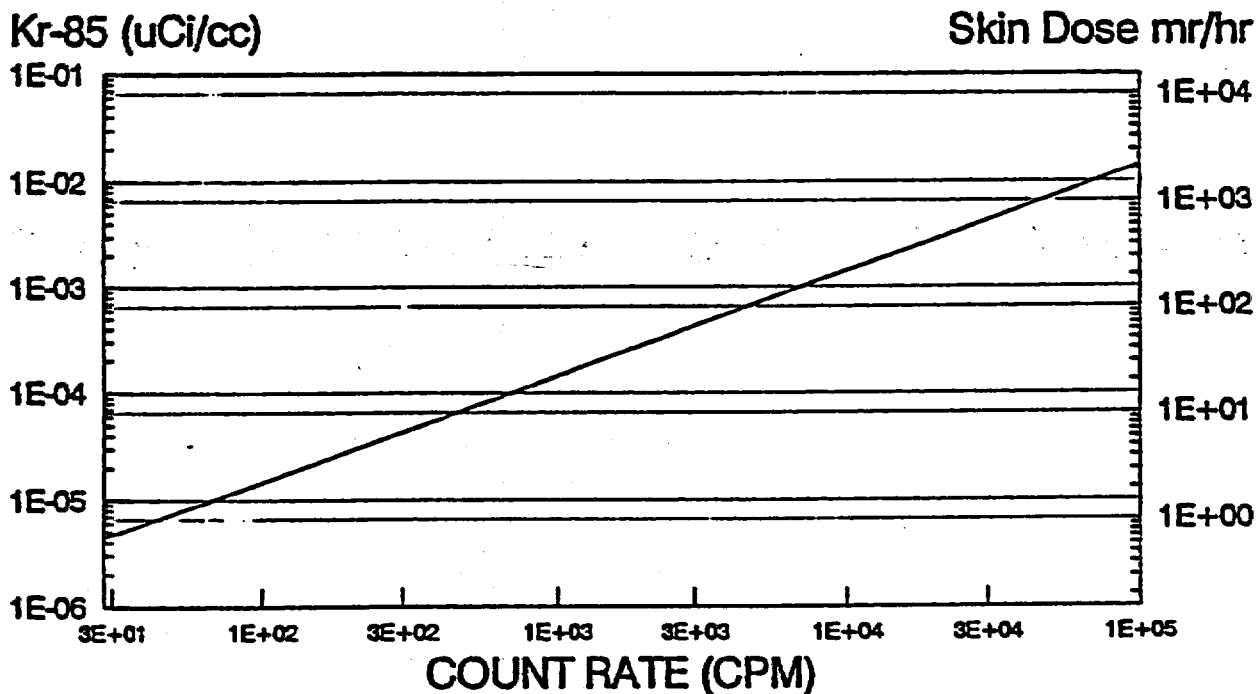
ATTACHMENT F

**GROSS AIRBORNE ACTIVITY (PARTICULATE FILTER)
VS. E-140 COUNT RATE WITH PANCAKE DETECTOR**



ATTACHMENT G

KRYPTON-85 CONCENTRATION VS. AMS-3 COUNT RATE



7.01E+6 cpm/uCi/cc
1.53E+5 mrem/hr/uCi/cc

ATTACHMENT H (Page 1 of 4)

DOSE PROJECTIONS

1.1 Calculate the Site Boundary Whole Body Equivalent Dose Rate.

- a. Record the SFP Exhaust Ventilation Monitor response - _____ $\mu\text{Ci/cc}$
- b. Record the actual SFP Exhaust Ventilation Rate - _____ cfm
- c. Calculate the Ventilation Flow Conversion Factor (VCF) as follows:

$$\text{VCF} = \frac{\text{(Actual Ventilation Exhaust Rate (cfm))}}{\text{(12,700 cfm)}}$$

(for conservatism, a VCF of 1.0 may be used)

d. Calculate the Site Boundary Whole Body Equivalent Dose Rate:

- 1) Using the following formula:

$$(1.68) \times (\text{SFP Exhaust Ventilation Monitor response } (\mu\text{Ci/cc})) \times (\text{VCF})$$

OR

- 2) SITE BOUNDARY WHOLE BODY DOSE EQUIVALENT RATE vs. SFP EXHAUST VENTILATION MONITOR RESPONSE (EXHAUST VENTILATION RATE OF 12,700 CFM) NOMOGRAM (Attachment H, Page 3).

- a. Locate the SFP Exhaust Ventilation Monitor Response and determine the Site Boundary Whole Body Dose Equivalent Rate (Exhaust Ventilation Rate of 12,700 cfm).
- b. Multiply the value obtained in 2.a by the VCF determined in step 1.1.c.

1.2 Determine the Site Boundary Skin Equivalent Dose Rate.

- a. Record the SFP Exhaust Ventilation Monitor response - _____ $\mu\text{Ci/cc}$
- b. Record the actual SFP Exhaust Ventilation Rate - _____ cfm

ATTACHMENT H (Page 2 of 4)

DOSE PROJECTIONS

c. Calculate the Ventilation Flow Conversion Factor (VCF) as follows:

$$\text{VCF} = \frac{\text{(Actual Ventilation Exhaust Rate (cfm))}}{\text{(12,700 cfm)}}$$

(for conservatism, a VCF of 1.0 may be used)

d. Calculate the Site Boundary Skin Equivalent Dose Rate:

1) Using the following formula:

$$(6.63 \times 10^2) \times (\text{SFP Exhaust Ventilation Monitor response } (\mu\text{Ci/cc})) \times (\text{VCF})$$

OR

2) **SITE BOUNDARY SKIN DOSE EQUIVALENT RATE vs. SFP EXHAUST VENTILATION MONITOR RESPONSE (EXHAUST VENTILATION RATE OF 12,700 CFM) NOMOGRAM (Attachment H, Page 4).**

a. Locate the SFP Exhaust Ventilation Monitor Response and determine the Site Boundary Skin Dose Equivalent Rate (Exhaust Ventilation Rate of 12,700 cfm).

b. Multiply the value obtained in 2.a by the VCF determined in step 1.2.c.

1.3 Record results on the following table, route to the Radiological Assessment Coordinator (When TSC is activated) (CRS-2)

Projected Equivalent Dose Rates	
SFP Ventilation Exhaust Monitor Response ($\mu\text{Ci/cc}$)	$\mu\text{Ci/cc}$
Site Boundary Whole Body Dose Equivalent Rate (mRem/hr)	mRem/hr
Site Boundary Skin Dose Equivalent Rate (mRem/hr)	mRem/hr
Reviewed:	(RAC) Time/Date

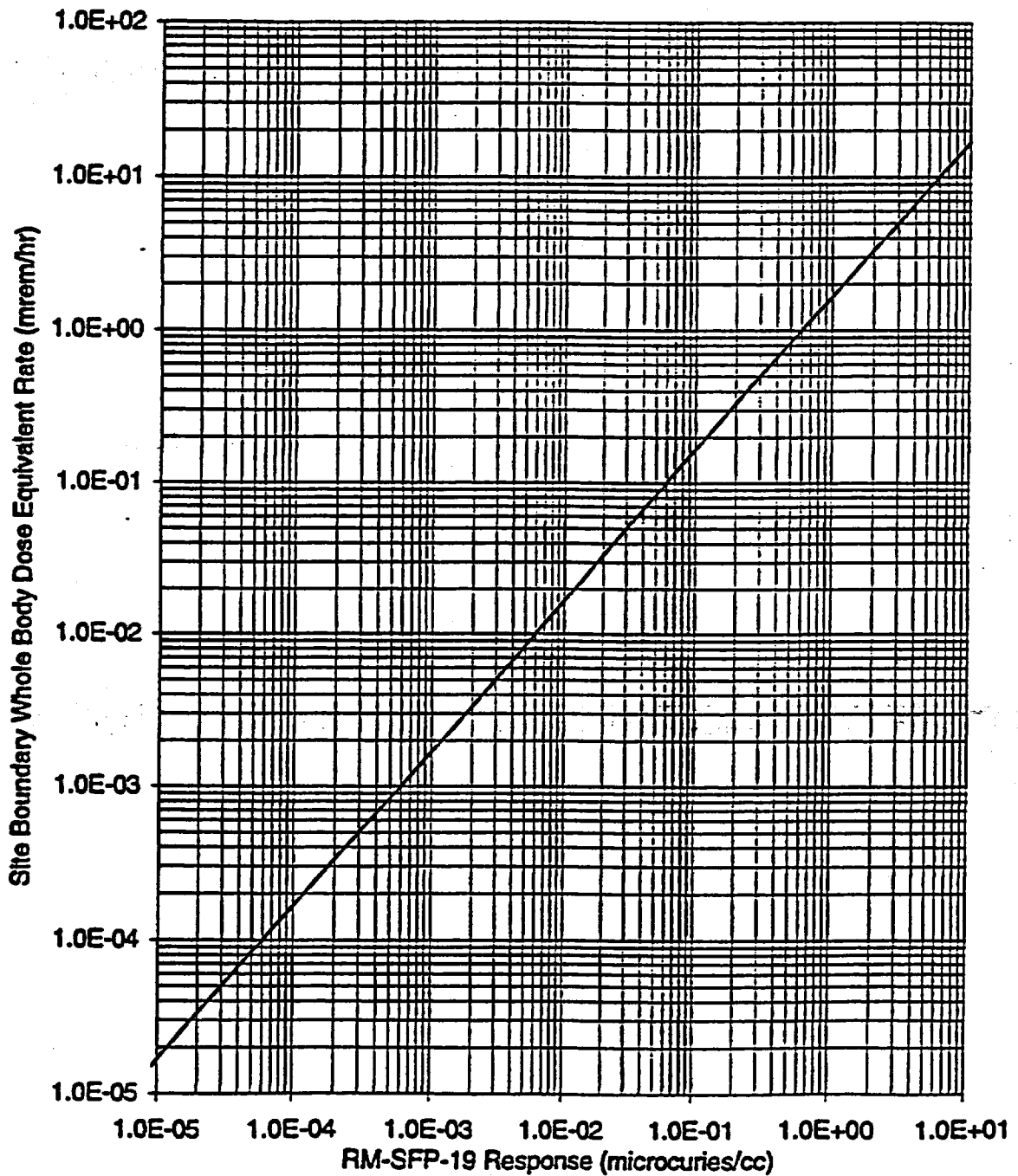
1.4 Record Dose Projections on Attachment I, Dose Projection Tracking Log.

1.5 Implement any on-site protective actions necessary using Attachment A, ON-SITE PROTECTIVE ACTIONS.

ATTACHMENT H (Page 3 of 4)

DOSE PROJECTIONS

SITE BOUNDARY WHOLE BODY DOSE EQUIVALENT RATE vs. SFP EXHAUST
VENTILATION MONITOR RESPONSE (EXHAUST VENTILATION RATE OF 12,700 CFM)
(Ref. MYC-2039)



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DOSE PROJECTIONS

SITE BOUNDARY SKIN DOSE EQUIVALENT RATE vs. SFP EXHAUST VENTILATION
MONITOR RESPONSE (EXHAUST VENTILATION RATE OF 12,700 CFM)
(Ref. MYC-2039)

