

DUQUESNE LIGHT COMPANY

SEAVER VALLEY POWER STATION EMERGENCY PREPAREDNESS PLAN (Operations Manual Chapter 57 - Emplementing Procedures)

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BEAVER VALLEY POWER STATION EMERGENCY PREPAREDNESS PLAN (Coeracions Manual Chapter 37)

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Supervisor, Testing & Plant Performance: SVPS

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DUQUESNE LIGHT COMPANY

Beaver Valley Power Station Nov 16, 1981

Nov 16, 1981 Date

Manual Transmittal

Please make the following changes to:

57

Title: __Emergency Preparedness Plan --- Vol 2 Procedures

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REVIEW AND REVISION OF THE EMERGENCY PREPAREDNESS PLAN

E.P.P. Approval Chapter 57

EMERGENCY IMPLEMENTING PROCEDURES

VOLUME II

Rev.		OSC Review	Approval		Effective
No.	Pages Issued	Date	Signature	Date	Date
6	EPP/IP 1.1 - Attachment 2 /IP-1.2 - Attachment 5 /IP-1.2.1 - All Pages /IP-1.3 - All Pages /IP-2.1 - Attachment 1 & 6 /IP-2.2 - Attachment 2 /IP-2.6 - Pages 1 thru 7,	2/10/82	HPWilliams	2/10/82	

EMERGENCY IMPLEMENTING PROCEDURE

LISTING

INSTRUCTIONS

- EPP/I 1. Recognition and Classification of . Emergency Conditions
 - 2. Unusual Event
 - 3. Alert
 - 4. Site Area Emergency
 - 5. General Emergency

IMPLEMENTING PROCEDURES

EPP/IP 1 series--Activation

- 1.1 Notification
- 1.2 Communications and Dissemination of Information
 1.2.1 Dissemination of Emergency Data Botween Emerg. Response Centers
 1.3 *** Communication of Emergency Data Botween Emerg. Response Centers
 1.4 *** The Proposer Status Checklist ED/ERM
- 1.4 TSC Organization and Operation
 - 1.4.1 Reserved
- 1.5 Emergency Support Center (OSC/ROC/ENC) Organization and Operation
 - 1.5.1 Operation of Technical Support Center Equipment
- 1.6 EOF Organization and Operation

EPP/IP 2 series--Assessment

- 2.1 Emergency Radiological Monitoring
- 2.2 Onsite Monitoring for Airborne Release
- 2.3 Offsite Monitoring for Airborne Release
- 2.4 Offsite Monitoring for Liquid Release
- 2.5 Emergency Environmental Monitoring
- 2.6 Dose Projection
 - 2.6.1 Dose Projection -- Short Form
- 2.7 Liquid Release Estimate
- 2.8 Reserved



EPP/IP 3 series--Onsite Protective Actions

- 3.1 Evacuation
 - 3.1.1 Unit 1 Construction Group Evacuation
 - 3.1.2 Unit 2 Construction Group Evacuation
 - 3.1.3 Administration Building Evacuation
- 3.2 Personnel Accountability
- 3.3 Emergency Contamination Control
- 3.4 Emergency Respiratory Protection
- 3.5 Traffic and Access Control

EPP/IP 4 series--Offsite Protective Actions

4.1 Recommendation of Offsite Protective Actions

EPP/IP 5 series -- Aid to Personnel

- 5.1 Search and Rescue
- 5.2 Handliny of Contaminated/Irradiated Personnel Injuries
- 5.3 Emergency Radiation Exposure Criteria and Control
- 5.4 Emergency Personnel Monitoring

EPP/IP 6 series--Re-entry/Recovery

- 6.1 Re-entry to Affected Areas--Criteria and Guidelines
- 6.2 Termination of the Emergency and Recovery

EPP/IP 7 series--Maintaining Emergency Preparedness

- 7.1 Emergency Equipment Checklist and Maintenance Procedure
- 7.2 Administration of Emergency Preparedness Plan Orills and Exercises

EPP/IP 8 Series -- Fire Fighting

8.1 Fires in Controlled Areas

EPP/IP 9 Series--Corporate Response

- 9.1 Emergency Public Information Plan--BVPS
- 9.2 DLC E & C Response Plan

EPP/IP Annexes

Annex A - Emergency Response Plan, Water Reactors Division Westinghouse Electric Corporation

EMERGENCY NOTIFICATION CALL-LIST

NOTE: The majority of the telephone numbers listed below are numbers designated for emergency purposes only. In most cases, these numbers should not be used for non-emergency communications. On week-bys between 8 am and 4 pm, use the normal business phone first.

NOTE: Ensure that the ECC "EPP/Normal" switches on the phones are in the "EPP" position to allow call-backs on routed to the ECC.

to be

NOTE: Calls to the offsite agencies listed on this sheet must be made in the sequence shown, as rapidly as possible following declaration of emergency, and prior to any notifications on remaining sheets. If one of the organizations can not be reached, continue with the next, and then re-attempt to notify the bypassed organization before continuing with the rest of the notifications.

1.	Organization/Individual Beaver Co. Emerg. Management Agency (BCEMA)	Normal Business	24-hr Emery	Alternate	Name of Contact	Time/Init	
	Dispatcher (24-hrs):relay to Mr. R. Chiodo			DLC Radio			
2.	Pennsylvania Emerg. Management Agency (PEMA) Duty Officer (24-hrs)			Relay through BCEMA			
3.	Columbiana Co. Disaster Services Agey (CCDSA) Dispatcher (24 hrs):relay to Mr. M. Lippiatt			DLC Radio			
4.	Hancock County Office of Emerg. Services (HCOES) Dispatcher (24 hrs)*:relay data to Mr. A. Kondik *Ask courthouse SWBD operator for dispatcher duri	ing hours. This	DLC Radio This is a direct line after hours.				
5.	US Nuclear Regulatory Commission Duty Officer (24-hrs)		PX red hotline				
GE	NERAL EMERGENCIES ONLY						7
5a	Ohio Disaster Services Agency (ODSA) Duty Officer (24-hrs)			Relay through CCDSA			-
56	West Virginia Office of Emergency Services (WVOES) Sheriff's Dispatcher (24-hrs)(Charleston)			Relay through HCOES			

EMERGENCY NOTIFICATION CALL-LIST (Con't)

NOTE:	See	not	es	on	Page	1
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Organization/Individual	Telephone	Alternate	Name of Contact	Time/Init
6. BVPS-1 Superintendent H.P. Williams				
7. BVPS-1 Operations Supervision L. Schad				
8. Shippingport Atomic Power Station				
9. BVPS Unit 2 Construction: R. Swiderski (Backshifts and weekends: ranking DLC-CDN or SBI Guar	rd)			
10. DLC Public Information Department (Notify one) J.D. Frank F. Skledar J.M. Sasala J.F. Grogan K.A. Scherer * Don Messner Each individual listed below will notify the next higher level of man Superintendent or designated alternate notifies the Manager, Nuclei	agement consistent ar Operations*.	t with the severity	* * of the emergency. The	e Station
Manager, Nuclear Operations T.D.Jones				
V.P. Nuclear Division J.J. Carey				
*				
ACTIVATION OF TSC/EOF ORGANIZATION VIA BEEPERS: (Note: Beaver County beepers (ask operator to tone-out #) Pittsburgh Area beepers (activated by telephone—no operator)				5
· Numbers a	vailable from N	nelear Shift Supe	visor	1

*these personnel have beepers.

EMERGENCY NOTIFICATION CALL-LIST (Con't)

	NOTE: The following organizations are notified only for the accidents noted in parenthesis next to their name.	
11.	U.S. Coast Guard (All offsite releases, actual or imminent) Marine Safety (Pittsburgh)	15
12.	U.S. Corps of Engineers (liquid releases) New Cumberland Dam (downriver) Montgomery Dam (upriver)	T
13.	Midland Water Plant (liquid releases) (Notify one) Mr. D. Craik Mr. McHaffie Mr. Haywood	
14.	East Liverpool Water Plant (liquid releases) Mr. Francis Wise	
15.	Chester, WVA Water Plant (liquid releases) Notify via HCOES	
16.	Westinghouse Atomic Power Division (Alert & higher) (Notif: Mr. D. Campbell Mr. D. Lokay Mr. R. Von Osinski	5
18.	INPO (Alert & higher) National Weather Service (Site+General Emergencies) American Nuclear Insurers Fire/All risk emergencies Radiological nuclear emergencies	1:
	In addition to the above, the following organizations, although not directly notified are authorized to receive information regarding the emergency:	
	DER/Bureau of Radiation Protection, Pennsylvania DER/BRP hotline will be operative upon activation of DER/BRP by PEMA.	
	State of Ohio Disaster Services Agency	
	State of West Virginia Office of Emergency Services	

West Virginia Dept. of Health/Radiation Protection



EMERGENCY NOT FICATION CALL-LIST (Con't)

The following organizations are not normally notified directly in the event of an emergency at BVPS, but may be contacted if particular emergency conditions warrant.

Pennsylvania State Police (L.). RENDER)

Pennsylvania State Police (Chippewa Barracks)

Laurel Pipeline Co. (Mr. T. Gordon)

Mobil Pipeline Co.

National Transit Co. (Mr. E. Bernard)

Ashland Pipeline Co.

Freedom Station

Buckeye Pipeline Co.

DOE RAP/IRAP Brookhaven Area Office

Medic-Rescue Ambu nce Service

Community Ambulance

Shippingport Fire Department

Aliquippa Hospital Emergency Room

Beaver County Medical Center

Presbyterian University Hospital Emergency Room

Radiation Emergency Response Program

Dr. Neil Wald-Dept. of Radiation Medicine

Dr. Albert Spritzer

Crucible Steel Company 10th Street Gatehouse

Linde Air Company (Mr. Jeward Ypma)

McIntosh Hemphill (E.W. Bliss)

Mr. R. Ansevin

Mr. D. Lemesh

Bruce Mansfield Power Station

Plant Superintendent (D. Bodar)

Assist. Superintendent (D. Thomas)

Shift Supervisor

Conrail Division Supervisor

Pittsburgh and Lake Erie Chief Dispatcher

US Weather Bureau-Pittsburgh

Air Polution Meteorologist

Forecast Office

Corapolis Office

Note: The phone numbers listed above are updated on the annual review. More up-to-date numbers are available in the monthly and quarterly emergency telephone number checklists, and are available in the Control Room.

Issue 6 Rev 5

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USING AUTO-DIALER AND ANSWERING MACHINE TO MAKE CALL-OUTS

A. PURPOSE

This attachment provides instructions for the use of the auto-dialer and the answering machine to make emergency personnel call-outs.

B. PROCEDURE

General Sequence

- 1.1 Activate the answering machine in accordance with instructions provided in section 3 of this attachment.
- 1.2 Select the outgoing message tape appropriate to the class of emergency and place the tape in the outgoing tape player in accordance with the instructions of section 3.
- 1.3 Set the answering machine to answer and record incoming messages.
- dialing and conversation during the notification process will be done on the line which Auto-DIALER IS CONNECTED.
- 1.5 Depress the "Pittsburgh Beepers" button on the dialing unit. The telephone reaction must be hung up for the dister to operate. When the other party answers, you will hear two or three tones and then a dial tone. The Pittsburgh beepers are activated by computer.
- 1.6 Hangup the phone Alle such call is completed.

 This must be done to clear the line for additional calls.
- 1.7 Depress the "Beaver County Beepers" button on the dialer. When the other party answers (an answering service) say:

"This is the Beaver Valley Power Station. Please tone out beepers (\star). This is an emergency."

* Number available from Shift Supervisor



- 1.8 Continue with other notifications in accordance with EPP/IP-1.1 and Attachment 2 to that procedure.
- 1.9 After five (5) minutes, repeat steps 1.5 through 1.7 (bone out the beepers again, as to ensure activation + response of emergency personnel).
- 1.10 After sufficient time has elapsed for personnel to respond to the beepers, rewind the incoming message tape, play back the tape, and list those personnel who acknowledged the notification. and call those individuals using the Bell telephone (egan card dialor). If the primary designee cannot be reached, notify a designated alternate in the sequence provided in the monthly call list. Apprise the Emergency Director (Shift Supervisor until relieved) of any shortfalls in personnel activation.
- NOTE: If the beepers are used to notify personnel of an Alert emergency, the beepers should be resounded if the condition escalates to a Site Area or General Emergency, in order to activate EOF personnel.
 - 1.11 When the answering machine is no longer in use, rewind the incoming message tape, insert the standby message tape and set the unit for autoanswering as in steps 3.1 and 3.2.

2. Use of the Auto-dialer

- 2.1 The auto-dialer is connected in the computer room.

 This line must be related in the white phone on the concelle and that line must not be in use for the dialer to operate. Since the dialer is an extension on this line, all of the phones on this line and the dialer must be off in order to clear the line and obtain a dial tone.
- 2.2 To place a call with the dialer, proceed as follows:
 - 2.2.1 Proceed to the computer room where the auto-dialer is located.
 - 2.2.2 With the handset on the phone still on the receiver, press the button associated with the party you wish to call. It is not necessary to depress the ON/OFF button, as the device will turn-on when any call button is pressed.



- 2.2.3 The dialer will display the number dialed on the LCD display, and the speaker (volume control on left side of dialer).
- 2.2.4 When you have the oppospriate party, when you have the phase being called start to ring, pick up the bandset and commence the notification.
- 2.2.5 When the call is complete, hangup the handset, and turn off the
- 2.2.6 Repeat the above for each additional party to be called.

3. Use of the Answering Machine

NOTE: Do not change machine controls when the RECEIVED-IN USE lamp is lit. Wait for the light to go out before proceeding.

3.1 Changing the Message Tape

- 3.1.1 With none of the control buttons depressed, open the rear tape player by lifting the small tab to the left of the unit's case.
- 3.1.2 Slide the tape cassette forward to remove it from the player.
- 3.1.3 Insert the correct tape in the slot with the full reel on the $\overline{\text{LEFT}}$ with the cassette opening facing out.
- 3.1.4 Press down on the cover to insert the tape cassette.
- 3.1.5 To verify that the proper tape is in place and to rewind the tape proceed as follows:
 - .1 Position the control knob to the ANNOUNCEMENT position.
 - .2 Depress the ON button.
 - .3 Depress the ANNOUNCEMENT TEST button until the RECEIVED-IN USE lamp lights.
 - .4 Release the button to hear the tape. Adjust the volume control as necessary.
 - .5 The tape will stop when the playback is complete and automatically rewind.

3.2 Setup for Automatic Operation

With the proper outgoing announcement tape in place, set up the answerer for automatic operation as follows:



- 3.2.1 Rewind the incoming message tape as follows:
 - .1 Position the large control knob to the PLAYBACK position.
 - .2 Depress the REWIND button (If the ON button is depressed, it will be necessary to first depress OFF).
 - .3 When the rewind is complete, depress OFF.
 - .4 Press the TAPE COUNTER RESET button to reset the counter.
- 3.2.2 Position the large control knob to the AUTO-ANSWER position.
- 3.2.3 The answering machine will now answer all incoming calls, provide the outgoing announcement, record the caller's acknowledgement, and rewind the outgoing message tape.

3.3 Replaying the Incoming Message Tape

After a sufficient period of time has passed to allow personnel to call in, replay the acknowledge messages as follows:

- 3.3.1 Observe the RECEIVED-IN USE pilot lamp. If the lamp is flashing, calls have some in and have been answered. If the lamp is lit, the machine is responding to a call. Wait for the lamp to go off.
- 3.3.2 Position the large control knob to the PLAY BACK position. When this is done, the incoming tape will automatically rewind.
- 3.3.3 When the tape is rewound, depress the ON button to start playback. Adjust MONITOR VOLUME as desired.
- 3.3.4 Depress OFF to stop playback. Use REWIND and/or FF (fast forward) as desired.)
- 3.4 When the machine is no longer in use, rewind the incoming message tape, insert the standby outgoing message tape, and set up the machine to answer incoming messages as described in steps 3.1 and 3.2

3.5 Recording an Outgoing Announcement

Note: There will usually be pre-recorded messages available for each classification of emergency. If one of these tapes fails or is missing, record an outgoing announcement as follows:

3.5.1 Insert a blank, standard cassette tape into the rear player as described in step 3.1.



- 3.5.2 Position the large control knob to the ANNOUNCEMENT position.
- 3.5.3 Depress the ON button
- 3.5.4 Depress the ANNOUNCEMENT REL button and keep it depressed until the RECEIVED-IN USE lamp lights and keep the button depressed.
- 3.5.5 Record the announcement slowly and clearly. Speak into the microphone at a distance of about 4 to 6 inches, using a normal speaking voice. Use the applicable format from Appendix 1 to this attachment.
- 3.5.6 When complete, release the ANNOUNCEMENT REC button. Releasing the button records the end of message tone, thus, once the button is released, the message cannot be added to.
- 3.5.7 Review the recorded announcement as described in step 3.1
- 3.5.8 If the message requires correction, repeat steps 3.1.1 through 3.1.6.

4. Performing Weekly Beeper Checks

This procedure shall be performed every Monday at 9 PM:

- 4.1 Using the procedures above, check that "standby/no-action" tape is in the outgoing tape player
- 4.2 Using the auto-dialer, call out both the Beaver County and Pittsburgh beepers in accordance with the procedures above.
- 4.3 Personnel away from the site at this time should note whether or not their beeper sounds. It is not necessary to call-in. If the beeper did not sound, note your location and bring the malfunction to the attention of the Emergency Planning Supervisor.



SAMPLE MESSAGES

Normal Operations

"You have reached the Beaver Valley Power Station. This line is not in use at this time. Please check your directory for the proper telephone number."

Unusual Events (Beepers not sounded)

"This is the Beaver Valley Power Station. There has been an unusual event emergency. There is no personnel call-out at this time."

Alert Emergency--Non-radiological

"This is the Beaver Valley Power Station. There has been an Alert Emergency. All Technical Support Center personnel shall report to their assigned emergency locations. Radcon technicians are not needed at this time. At the tone, acknowledge this message by giving your full name, and estimated time of writel."

Alert Emergency--Radiological

"This is the Beaver Valley Power Station. There has been an Alert Emergency. All Technical Support Center Personnel shall report to their assigned emergency locations. Radcon technicians shall be called out. At the tone, acknowledge this message by giving your full name, and estimated time of arrival."

Site Area Emergency

"This is the Beaver Valley Power Station. There has been a Site Area Emergency.
All Technical Support Center and Emergency Operations Facility personnel including radcon technicians, shall report to their assigned emergency locations. At the tone, acknowledge this message by giving your full name, and estimated time of write

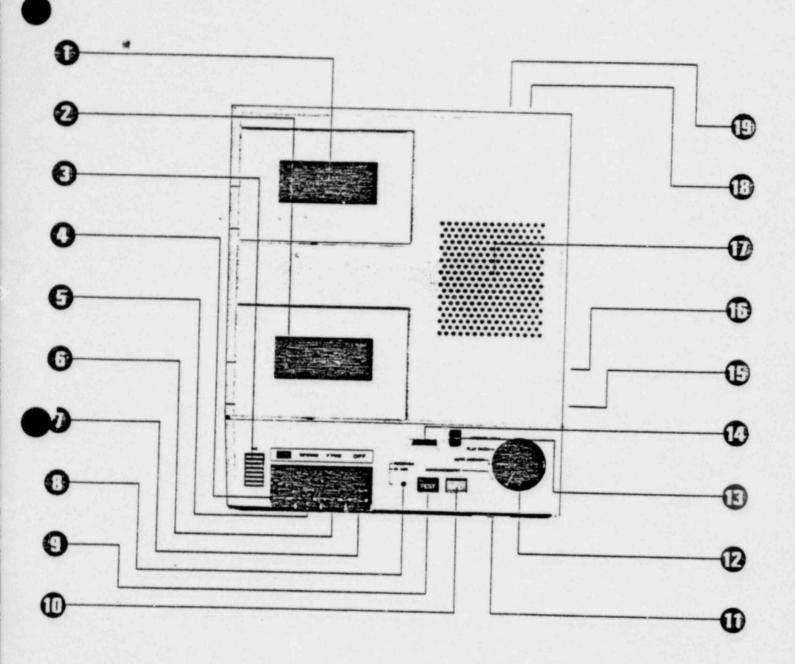
General Emergency

"This is the Beaver Valley Power Station. There has been a General Emergency. All Technical Support Center and Emergency Opprations Fcaility personnel including radcon technicians shall report to their assigned emergency locations. At the tone, acknowledge this message by giving your full name, and estimated time of armial:

NOTE

FOR ALL EXERCISES/DRILLS, THE RECORDED MESSAGE SHALL BE PREFACED AND ENDED WITH THE PHRASE "This is a drill".

Telephone Answering system Features:



- Outgoing Message Cassette Compartment
- 2. Incoming Message Cassette Compartment
- 3. Built-in Microphone
- 4. ON Button
- 5. Rewind Button (REWIND)
- 6. Fast Forward Button (FFWD)
- 7 OFF Button
 - IN USE and RECEIVED Lamp
 - Test Button
 - Record Button

- 11. Volume Control
- 12. Selector Dial
- 13. Counter Reset Button
- 14. Tape Counter
- 15. Voice Control Switch
- 16. Ring Delay Switch (#1)
- 17. Speaker
- 18. Power Jack
- 19. A, A1 Switch (unlimited)

EMERGENCY IMPLEMENTING PROCEDURE

DISSEMINATION OF EMERGENCY DATA BETWEEN EMERGENCY RESPONSE CENTERS

A. OBJECTIVE

This procedure describes the general communications protocols to be used during emergency conditions to transfer data between the various elements of the Beaver Valley Power Station emergency organization and between the various emergency response facilities.

This procedure supplements the information and instructions contained in EPP/IP-1.2, "Communications and Dissemination of Information" and in Chapter 40 of the Station Operating Manual, as it applies to internal communications.

B. PREREQUISITES/INITIAL CONDITIONS

 An emergency condition has been declared at the Beaver Valley Power Station as provided in the BVPS Emergency Preparedness Plan;

and/or

2. The emergency organizations have been activated.

C. PRECAUTIONS

None

D. GUIDANCE AND CRITERIA

This procedure provides general information on how technical and operational data are transferred between various individuals in the emergency organization. This procedure is intended to serve as guidance and need not be followed step-by-step. The actual emergency conditions and/or contingencies that occur, such as failure of communications equipment, may make portions of this procedure inappropriate. TSC/EOF supervisory personnel should institute other appropriate measures or protocols aimed at the most effective and accurate exchange of information.



E. PROCEDURE

1. General Provisions

- 1.1 Each individual in the emergency organization must continuously evaluate the information that he becomes aware of and ensure that, when appropriate, this information is made available to others in the organization who may be able to use it.
- 1.2 Personnel transferring information must remain alert to the nature of the personnel who will be receiving the information, and ensure that the data are transferred in a terminology that is likely to be understood by the recipient. As an example, some personnel may understand what "FR-VS-112 reads 30,000..." means, but most will understand "the supplementary leak collection release flow rate is 30,000 cubic feet per minute..." much more readily. Extreme care must be exercised in this regard when communicating with offsite agencies.
- 1.3 The key supervisory personnel in the emergency organization, especially the Emergency Director and/or the Emergency/Recovery Manager, should minimize their use of communications circuits, using junior personnel to perform most communications. Time spent on the phone is time spent away from managing the emergency response.
- 1.4 Communications personnel and other TSC/EOF personnel should make every effort to serve as "buffers" to the Emergency Director or Emergency/ Recovery Manager, in order to minimize the need for these individuals to personally handle requests for information from individuals outside of the BVPS Emergency Organization.
- 1.5 It is the policy of Duquesne Light to promptly provide appropriate and accurate information in response to reasonable requests from offsite agencies and individuals. However, channels for providing this information have been established and should be followed to maximum extent possible.



- 1.5.1 Requests for information from members of the news media or from unidentified individuals shall be referred to Duquesne Light Public Information Department personnel at the Emergency News Center. This protocol has been established to ensure that all releases of information to the general public are accurate and have been coordinated with the public affairs personnel of the various offsite agencies.
- 1.5.2 Requests for information from offsite agencies via telephone shall normally be handled by communications personnel using the follow-up notification form. The follow-up notification form shall be prepared by the Communications and Records Coordinator and approved by the Emergency Director.
- 1.5.3 Although all TSC/EOF personnel should courteously and accurately respond to the enquiries of offsite agency personnel in the EOF, personnel should avoid getting into long discussions which would detract from their primary responsibility. This is particularly the case when offsite personnel ask background or explanatory questions in order to understand the accident at hand. In these cases, the questions should be referred to the Offsite Agency Liaison for answering. In order to avoid some of these questions, the Offsite Agency Liaison should periodically brief these offsite personnel, explaining any data which may not be understood. For example, the Emergency Director may announce that the the "VCT level is 23%...." The role of the Offsite Agency Liaison in this case would be to explain what the VCT is, its role in the accident, its role towards safety, and the significance of the reading.

2. Handling Incoming Information via Telephone or Radio

Information received at the TSC/EOF pertinent to the emergency response effort and for which no pre-designated data sheet exists, will be handled as follows:

- 2.1 The incoming information will be recorded on a carbon message form ("speed letter") by the individual receiving the data.
- 2.2 Each message should be clearly identified by time, date, and message recipient.
- 2.3 Copies of the message forms will be distributed as follows:

Top copy (original)

to the Emergency Director

2nd Copy

to the Emergency/Recovery Manager

3rd Copy

To the individual responsible for taking action on the data (eg: report on offsite dose should be given to EA & DP)



- 2.4 When the Emergency Director and/or Emergency/Recovery Manager has read the form, the form should be given to the status board keeper for transfer to the status board--if applicable.
- 2.5 When the data has been transferred, the status board keeper will retain the form for record keeping.

3. Use of Phone Talker Circuits

The two phone talker circuits connecting the emergency response centers are used as follows:

- 3.1 The phone talker circuits are intended to be used to transfer short, brief messages, primarily parameter data or instructions, between the various emergency response centers. There are two distinct circuits: (1) radiological assessment, and (2) operational control.
 - 3.1.1 The radiological assessment circuit is intended to provide a communications capability between the emergency organization members having responsibility for onsite and offsite radiological assessment. The circuit configuration provides for simultaneous communications between all points.
 - 3.1.2 The operational control circuit is intended to provide a communications capability between the emergency facilities for the purpose of controlling the overall response of the emergency organization, to provide the various personnel a means of reporting data to the TSC/EOF, and to backup the CATV system for parameter data retrieval.
- 3.2 Longer duration conversations should generally not be conducted on the phone talker circuits. These converstations should be conducted on other communications circuits.
- 3.3 Communications on the phone talker circuits should take the following format:
 - Message originator relays message verbally to his phone talker,
 - phone talker repeats message back to originator,
 - phone talker relays message on circuit,



- addressee phone talker repeats the message on the circuit to the sending phone talker,
- addressee phone talker relays message to addressee,
- addressee acknowledges message.
- 3.4 When not directly involved with a message, phone talkers should remain alert to other communications on their circuit. If the information in a communication would be of interest to personnel in their area, the information should be repeated aloud, and if appropriate, recorded on the status board.
- 3.5 Generally, message forms ("speed letters") do not need to be used for communications on this circuit.

4. Use of TSC/Control Room Intercom Circuit

- 4.1 The TSC/Control Room intercom circuit is a dedicated, ring down intercom circuit connecting the control room and the TSC. The purpose of this circuit is to provide a reliable means of conducting longer term conversations between the control room personnel and TSC personnel. As such, this system supplements the CATV and phone talker systems.
- 4.2 There are four lines, two of which are pre-designated: (1) the Shift Technical Advisor phone, and (2) the Operations Coordinator phone. TSC personnel desiring to talk to one of these personnel should use the appropriate phone line. Calls to individuals other than the STA or Ops. Coord. should be made on other circuits.

5. Use of CATV System to Obtain Parameter Data

- Note: Detailed instructions on the set-up and continued operation of the CATV system is provided in EPP/IP-1.5.1. This section addresses how the equipment will be used to obtain information.
 - 5.1 Data sheets are provided in the TSC to facilitate data retrieval via the CATV system. These data sheets contain spaces to enter data on a standard parameter set. This parameter set was chosen to provide the primary



indications necessary to support assessment activity. The parameter set has been divided into three groups—one for each of the camera control units.

- 5.2 Upon activation of the TSC, CATV personnel in the TSC shall take a complete set of readings, recording the data on their individual data sheets.
- 5.3 When complete, the data sheets will be separated, and the copies distributed to the status board keepers in the TSC and EOF.
- 5.4 The status board keepers will enter the data on the status boards and retain the data sheets for record purposes.
- 5.5 The frequency of data taking will be determined by the Technical Support Coordinator to be consistent with the rate of change in plant parameters.
- 5.6 If a particular data item requires trending, a camera will be trained on that indication and recorded on the VCR.
- 5.7 If TSC personnel identify the need for data other than that included in the standard parameter set, CATV personnel should try to obtain that reading via the CATV system. If a particular indication is not readily available on the system, the operational control phone talker should be used to obtain the necessary information.
- 5.8 Aids for locating the various instruments are attached to this procedure and are available in the TSC. Generally, it will be easier to locate a given instrument, if the camera is first zoomed out, then the indication positioned in the center of view using tilt and pan controls, and then zooming in on the indication.

6. Use of the Status Boards

6.1 Status boards are provided in the TSC and EOF for tracking data and response actions. Status boards display the data such that it is available to all personnel in a given area. The boards also help to minimize



forgetting an important parameter or action, and allow more persons to participate in the assessment process.

- 6.2 The status boards in the TSC and EOF consist of two types: (1) the plant system mimic diagram, which provides for the display of important plant parameters; and (2) the narrative board, which provides for sequential display of response actions taken or significant reports.
- 6.3 The status board keepers will keep the status boards current with data provided by personnel in their area. Data on the narrative status board will be periodically reviewed. and oraced to provi

7. Use of the Page-Party System

- 7.1 The Emergency Director and/or the Emergency/Recovery Manager should make periodic announcements on the plant status over the page-party system to keep all site personnel appraised of the response effort.
- 7.2 The frequency and content of these announcements should be consistent with the rate of change in events and the significance of the data to the entire response organization. An announcement of no change in status is as important as a report of change in status.

F. REFERENCES

- 1. Beaver Valley Power Station Emergency Preparedness Plan and Implementing
- 2. Title 10 CFR 50
- Beaver Valley Power Station Operating Manual Chapter 40
- NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

G. ATTACHMENTS

- 1. CATV Data Sheets
- 2. BVPS-1 Control Room Instrument angement
- 3. Standard Parameter Set Location in Control Room bhe provided

TECHNICAL SUP	PORT CENTER		
			CAMERA:
STANDARD PAR	AMETER SET		2
			3
RM-201	mr/hr		3
RM-202	mr/hr		
RM-VS-101B	СРМ		
RM-VS-1078	СРМ		
RM-GW-1088	СРМ		
35'	500'	mph	
35'	500'	deg.	
150-35'	500-35'	o _F	
his data need r	not be taken.		
Data T	aker:		
	RM-201 RM-202 RM-VS-101B RM-VS-107B RM-GW-108B 35' 35' 150-35'	RM-201 RM-202 RM-202 CPM RM-VS-101B CPM RM-GW-108B CPM 35' 500'	### STANDARD PARAMETER SET RM-201

CAMERA:4

Cont. Press (VB-A1)	PS	SIA (0-70; 7	.5-12.5)	
Cont. Temp. (VB-A1)	0 _F	(0-300)		
Recirc Sump Level (VB-A1)	fr	. (0-90)		
Hydrogen (local)	%			
*SI Accum. Lv1 (VB-A1)		b	c	% (0-100)
*These parameters should be taken then at the request of TS Coordi	n on the firs	t round of re	eadings and	
DATE: TIME:	Data Take			

CAMERA: 5

*Low Lv1 Orn T	'k Lv1 (VB-A2)	LW-TK-3A	LW-TK-3B	in (0-145)
*Laund. Drn Tk	s Lv1 (VB-A2)	LW-TK-6A	LW-TK-6B	in (0-48)
*HI Lv1 Drn Tk	s Lv1 (VB-A2)	LW-TK-2A	LW-TK-2B	in (0-120)
*Cool Rovy Tk		BR-TK-4A	BR-TK-48	ft (0-30)
*These paramete then at the red	ers should be quest of TS Co	taken on the	first round of	readings and
DATE:	TIME:	Data	Taker:	

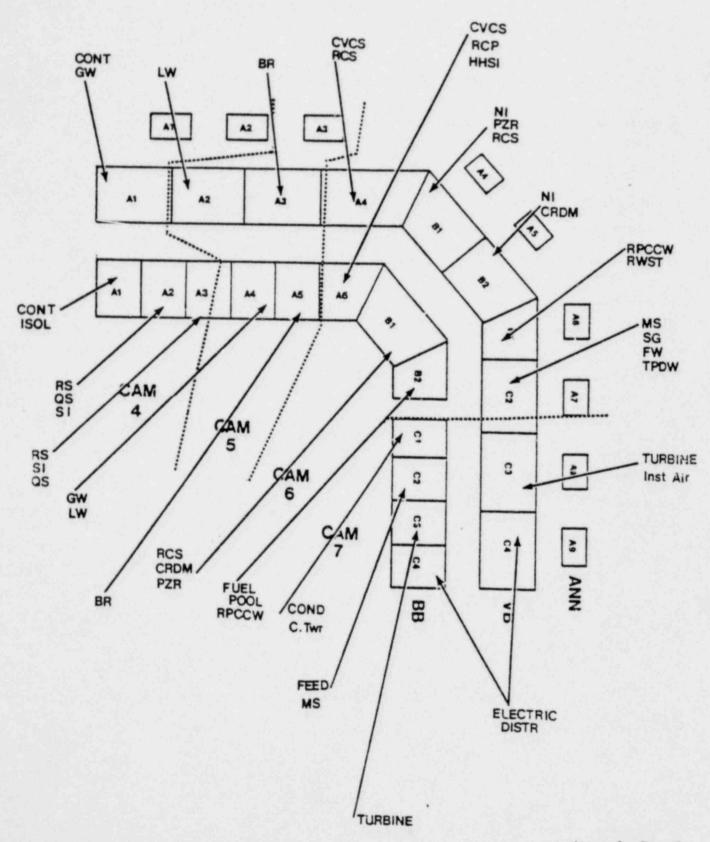
CAMERA: 6

Source Range Lv1 (BB-B2)	10	o - 10 ⁶ cps		
PZR Level (8B-81)		% (0-100)		
PZR Temperature (BB-B1)	FILE	°F (150-600)		
RCS Pumps (BB-A6)	on/off a	on/off b	on/off c	
SG Pressure (VB-C2)	a	 b	С	PSIG (0-1500)
SG Level (VB-C2)	a	<u> </u>	c	% (0-100)
Steam Flow (VB-C2)	a	b	c	PPH (0-4 x 10 ⁶
RCS Pressure (VB-A4)		PSIG (0-3000;	0-600)	
RCS Hot leg Temp (VB-A4)	a red	b grn	c blue	°F (0-700)
RCS Cold Leg Temp (VB-A4)	a red	b grn	c blue	^o F (0-700)
RCS FLOW (VB-A4)	a	<u> </u>	c	% (0-120)
Main Feedwater (VB-C2)	flow/no flow a	flow/no flow	flow/no flow	
Aux Feedwater (VB-C2)	flow/no flow a	flow/no flow	flow/no flow	
*PZR Relief Tk Lvl (VB-B1)		% (0-100)		
*PriWatStorTk Lv1 (VB-C1)	BR-TK-6A	BR-TK-6B	ft (0-25	
*RWST Lv1 (VB-C1)	QS-TK-1	ft		
*TPOWST (VB-C1)	WT-TK-11	WT-TK-10)	ft (0-39; 0-30)%
*VCT Level (VB-A4)		% (0-100)		
*Pri Drns Xfer Tks (VB-A4)	DA-TK-1	DA-TK-2	in (0-48)	
*These parameters should be then at the request of TS Co	taken on the f	irst round of re	adings and	
DATE: TIME:	Data T	aker:		

CAMERA: 7

MSIV Position (BB=C1)	open/shut a	open/shut b	open/shut	
Electr. Dist. (BB-C4)	yes/no 345 kv	yes/no 138 kv		
Diesel Gen. (BB-C4)	yes/no DG 1	yes/no DG 2		
Battery (VB-C4)	1	2	3	Volts (0-150)
Battery (VB-C4)	4	5	Volts (0-150)	

DATE:	TIME:	Data	Taker:	



DUQUESNE LIGHT EPP/IP-1.3 Emergency Director/Emergency Recovery Manager Page 1 of 6 Turnover Status Checklist DATE: 1. EPP status - (Classification) Unusual Event Alert Site Area Emergency General Emergency Time Check Watch Reset 2. Have notifications been given? when? DLC Personnel Offsite Areas 3. General chronology of events Time Event TSC ACTIVATED EOF ACTIVATED Protective Actions Unit evacuation yes no Site evacuation yes when no Offsite evacuation when yes no Sheltering when yes no Accountability yes when no Site closed to Visitors yes

no

when

DUQUESNE LIGHT Emergency Director/Emergency Recovery Manager Turnover Status Checklist DATE:

EPP/IP-1.3 Page 2 of 6

Time		Event
-		
	_	
atest unit sur	rvey results: Time	
atest site sur	vey results: Time	Status
itest off-site	radiation survey results:	
Time	Location	Page 1
		Results
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

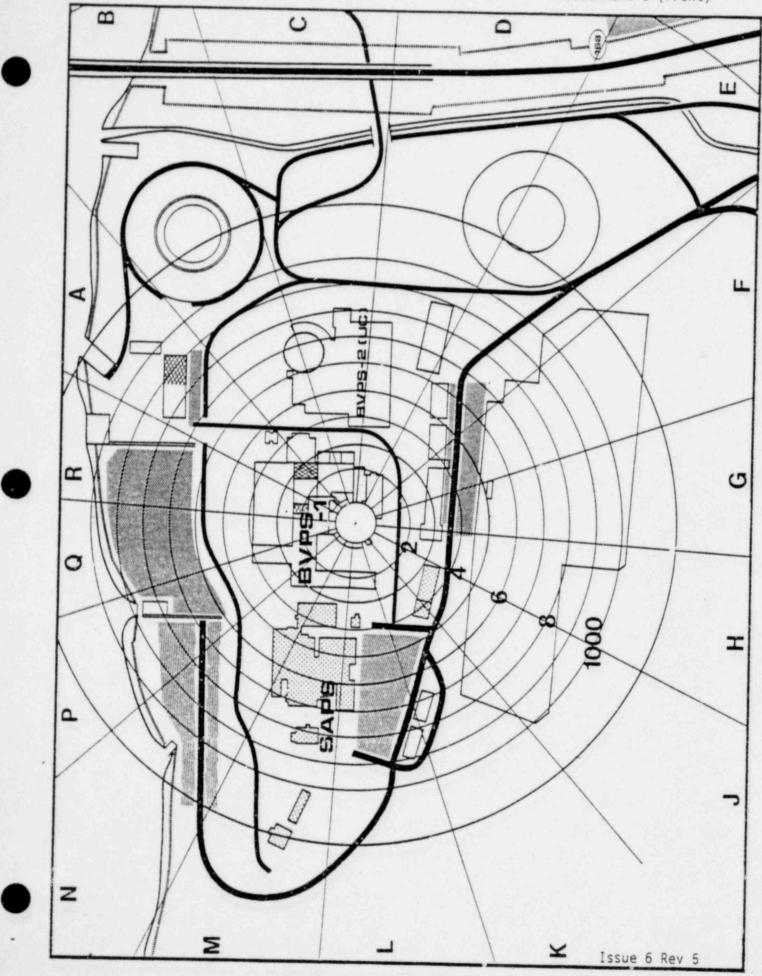
DUQUESNE LIGHT EPP/IP-1.3 Emergency Director/Emergency Recovery Manager Page 3 of 6 Turnover Status Checklist DATE: 9. Dose Projection Information: Time Results 10. Status of Off-Site Notification (Copy) Agency Time Individual Contacted Comments BCEMA PEMA CCDSA HCOES 11. Plant Status: Accident/Emergency ____Damaged System ESF System Availability Ventillation System System/Rad Monitor Unavailability_____

Emer	ESNE LIGHT gency Director/Emergency Recover Status Checklist	overy Manager	EPP/IP-1.3 Page 4 of 6
12.	Injured or contaminated per	sonnel	
	Name	Employer	Status:Ambulanc
		_	
	11		
13.	Accountability:		
	Accountability taken	(Ti	ma)
	Results:	(1)	me /
	BV1 BV2		
	SAPS		
	Assembly Areas Occupied	Status	
4.	Call out status:		
	Operations		
	Radcon		
	Maintenance		
	Mech.		
	I & C		
	Emergency Organ.		
	TSC	APRIL TOTAL	
	EOF		

DUQUESNE LIGHT EPP/IP-1.3 Emergency Director/Emergency Recovery Manager Page 5 of 6 Turnover Status Checklist DATE: 15. Emergency News Center, activated: _____ In Charge: _____ 16. Potential for plant degradation: 17. Potential for Off-Site release of radioactivity: Airborne Water

ency Director/Emergency Recovery Manager ver Status Checklist	Page 6 of 6
Planned Activities(Next 6 hrs.):	
ix to Twelve Hrs.:	

DUQUESNE LIGHT



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EPP/IP-2.1 ATTACHMENT 6

LOCATION: (ONSIT	E) (OFFSITE)	SURVEY ROUTE:	(NW) (SW) (NE)	(SE)	DISTANCE: (5) (10) miles	DATE:
CALCULATIONS BY:						MONITORING TEAM LEADER:	

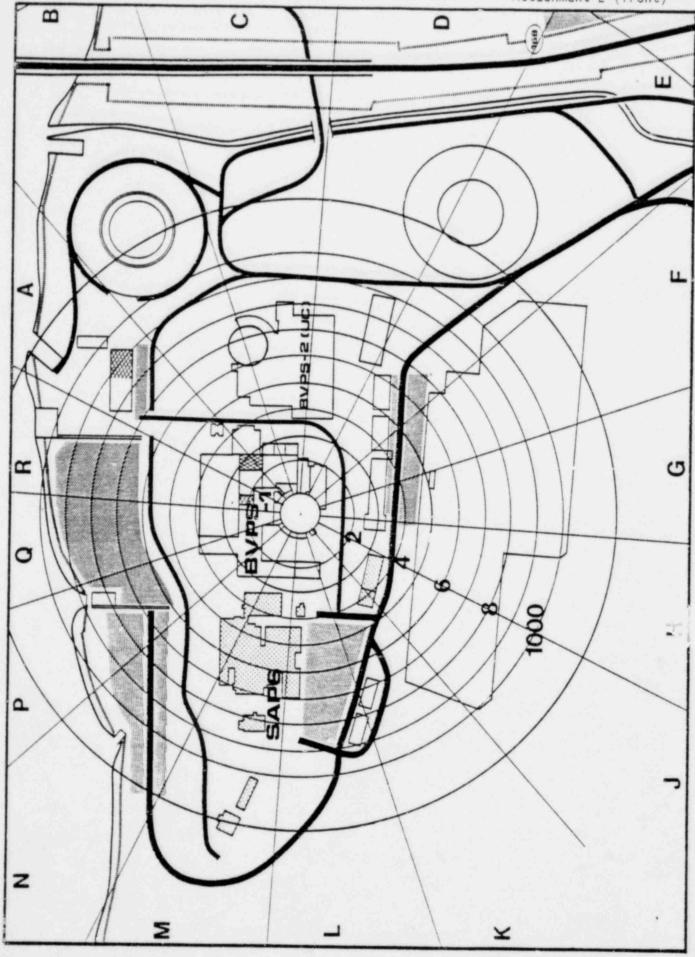
DOSE COMMITMENT FROM AIR SAMPLE DATA - E140/HP210 INSTRUMENT

8		b	e	đ	•	1	8	h	1	1	k		
Time	Survey Point	Closed Window mR/hr	Parameter	C _g (epm)	C _b (cpm)	C _{net} (cpm)	Sample Volume (ft ⁵)	Conversion Pactor	Cone. (µCl/ee)	Total Cone. (µCl/ce)	Conv. Factor	Total Dose* (mrem/hr)	
11-1			Air Filter					1.94 E-10			7.73 E5	7.73 E5	-
			Charcoal					1.35 E-8					
in and			Ag7.eolite					8.52 E-10					
			Air Filter					1.94 E-10			7.73 E5		
			Charcoal					1.35 E-8		.+			
			AgZeolite					8.52 E-10			7.73 E5		
			Air Filter					1.94 E-10					
			Charcoal					1.35 E-8					
			AgZeolite					6.52 E-10					
			Air Filter					1.94 E-10					
			Charcoal					1.35 E-8					
			AgZeolite					6.52 E-10			1111	100	
			Air Filter					1.94 E-10			7.73 E5		
			Charcoal					1.35 E-8					
			AgZeolite					6.52 E-10			13.15	- 112	
			Air Filter					1.94 E-10			7.73 E5		
			Charcoal					1.35 E-8					
			AgZeolite					6.52 E-10		-1-			
			Air Filter					1.94 E-10			7.73 E5		
			Charcoal					1.35 E-8					
			AgZeolite					6.52 E-10					

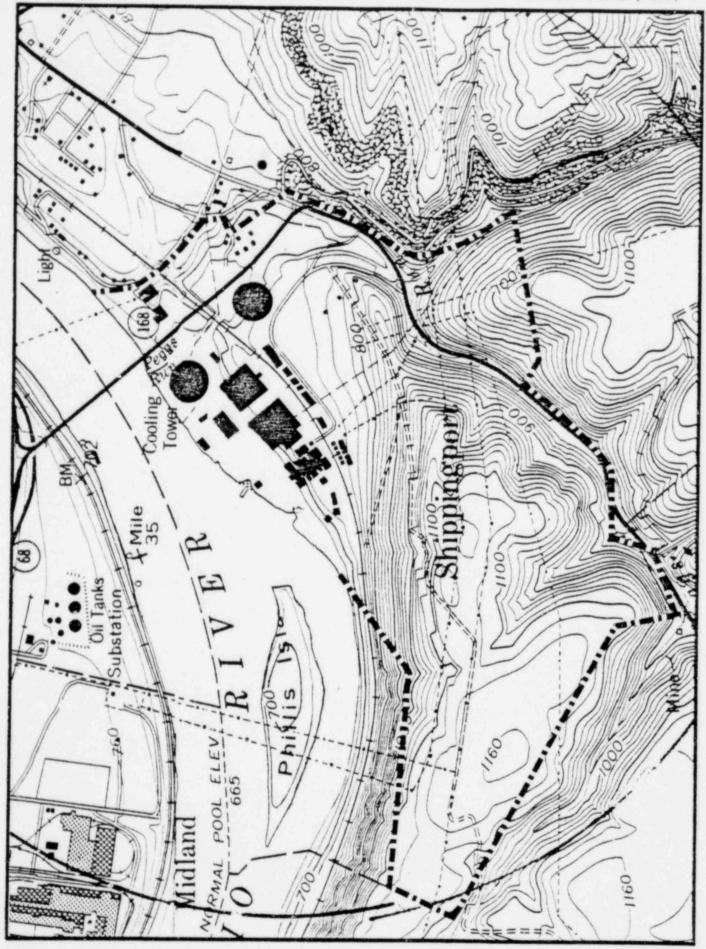
^{*}Dose = mrem per hour of inhalation of activity in column)

f = d - e

 $i = f \times h/g$ (AgZ, charcoal based on I-131, Part. based on Cs-137) $i = j \times k$ (based on I-131)



Issue 6 Rev. 5



Issue 6 Rev. 5

EMERGENCY IMPLEMENTING PROCEDURE

DOSE PROJECTION

A. OBJECTIVE

This procedure provides guidance and instructions to ECC personnel for estimating offsite doses resulting from an unplanned and/or unmonitored airborne release of radioactive material. The main body of this procedure identifies criteria and guidelines for dose projection, such as when is it required, how often should it be performed, and which dose projection procedure to use. The attachments to this procedure (tabs) provide instructions for performing dose projection using the various dose projection methods. A multiple of methods is provided to cover possible contigencies such as offscale monitors, inoperative meteorology instruments, etc.

B. PREREQUISITES/INITIAL CONDITIONS

- An emergency condition has been declared at the Beaver Valley Power Station as provided in the BVPS Emergency Preparedness Plan.
- A release of radioactive material in excess of environmental technical specifications (ETS) has occurred or is suspected to have occurred.

C. PRECAUTIONS

Precautions are specified in the text of the applicable tab(s).

D. DISCUSSION

1. Classification of Release

1.1 The dose projection calculation method chosen for use depends partly on the type of release. Categorize releases as follows:

Rx. Bidg. + SLCRS Vent (Atop Containment) RM-1VS-107 Ground Level

Ventilation Vent (Atop Auxiliary Building) RM 1VS-101 Ground Level

Process Vent-Gas. Waste Sys. (Cooling Twr) RM-1GW-108 Elevated Release

All Other Airborne Releases Ground Level



2. Dose Projection Methods

2.1 General

This procedure provides several different calculation methods for performing dose projections. The method(s) used will depend on the nature of the release, the availability of release and meteorology information, the operability of the meteorological monitoring computer, and the time available. Procedures for each of the methods is provided as Tabs 1 through 12 of this procedure. The tabs are arranged in two general The initial tabs describe different methods of obtaining X/Q, while the latter tabs describe different means of calculating the estimated offsite dose. (The X/Q calculated by any one method is suitable for any of the dose projection calculations, providing the meteorological conditions are unchanged.) The Emergency Director (Shift Supervisor initially) will determine which method is appropriate and perform the dose projection calculations until such time as the on-duty staff is augmented and a designated Environmental Assessment and Dose Projection Coordinator is available. At that time, the EA & DP Coordinator will determine which method in this procedure, or which additional methods, are suitable. To facilitate the selection of the proper method, each of the methods, and their prerequisites and limitations is discussed below.

2.2 Meteorological Monitoring System TAB-1

The meteorological monitoring system is a computer-based system which monitors meteorological conditions at the Beaver Valley Site. The system monitors meteorological conditions continuously over a fifteen minute period, averages the parameters, calculates the $\rm X/Q$ for elevated and ground level releases, provides a print-out of the fifteen minute average data, and repeats the cycle. The $\rm X/Q$ for a ground level release is calculated to the site boundary. The $\rm X/Q$ for an elevated release is calculated to the each of ten discrete distances, and the maximum $\rm X/Q$ and associated distance is printed out.

This method of determining X/Q is the most rapid method available as it requires no calculations on the part of the operator (assuming the system is on-line). Its limitation is the limited number of distances which can



be evaluated. It will be necessary to use other methods to calculate the projected dose at locations further than those provided.

2.3 Xu/Q Tables Method TAB-2

Tab-2 provides a X/Q determination method based on selecting a Xu/Q value corresponding to the observed stability class and desired distance from a table or graph. The X/Q value is then determined by dividing the Xu/Q value by the wind speed. This method involves only minimal calculation, provides for user chosen distances, and can be performed rapidly. Only ground level releases are addressed.

2.4 X/Q Overlay Method TAB-3

Tab-3 provides a X/Q determination based on transparent overlays which are positioned over a map of the emergency planning zone. Overlays are provided for various wind speeds and stability classes. Although this method involves no calculation, the method is not as accurate as that provided in Tabs 1 and 2.

2.5 X/Q Alternate Methods TAB-4

Tab-4 identifies alternate sources of meteorological information and provides guidance on using this data for determining X/Q if Station meteorological data is unavailable from site instrumentation.

2.6 Supplementary Meteorological Parameters TAB-5

This tab provides a means to determine the plume width and height, and the plume transit time. These paramters aid in the evaluation of meteorological data and in the application of protective action assignments downwind

2.7 Dose Projection by Hand Calculation Based of FSAR Accident Analysis TAB-6

This method calculates the whole body and thyroid doses for the event in which no specific release data is readily available. The method is based on the FSAR accident analyses. Since it is unlikely that the actual accident parameters will be the same as the accident analysis assumptions, this method is at best conservative.



2.8 Dose Projection By Hand Calculation Based on Monitor Reading TAB-7

This method is suitable for rapid determinations of whole body and thyroid doses based on gross beta or gross gamma effluent monitor reading. Correction factors are provided to adjust the monitor response for expected radioisotopic mixes for various accidents. Calculation worksheets provide an option of using numerical or graphical methods for this calculation.

In order to use this method, the monitor reading, the source of the radioactivity (type of accident), and the flow rate thru the monitor must be known.

2.9 Dose Projection by Hand Calculation Based on Known Isotopic Release Rate

The method described in this tab calculates the whole body and thyroid doses resulting from a known isotopic release rate. (For example: 1 E-4 μ Ci/cc of Kr-85 to be released at 15,000 cfm for 1 hour.) This method is more accurate than the previous methods, but will require more extensive calculations by the Emergency Director or the EA & DP Coordinator. Thus, this method is more suitable for planned releases, or releases which have not commenced, and for which time is available to perform the calculations.

2.10 Dose Projection by Hand Calculation Based on Known Release TAB-9

This method calculates the whole body and thyroid doses resulting from a known release of radioiodines and/or noble gases. (For example: 10 Ci of I-131 have or will be released.) As with Tab-8, this method is more accurate, but also more time consuming.

2.11 Dose Projection Based on Field Measurements Tab 10

This method calculates the whole body and/or thyroid doses from an unmonitored release by measuring the actual dose rate in the field and working backwards to calculate a source term to be used in the other calculations addressed in the other tabs. An alternate method provides for back-calculation of the radioiodine release source term. Due to the significant time delay necessary to dispatch a monitoring team and gather necessary information, this method should be used only as a last resort.



2.12 Dose Assessment Based on Environmental Measurements and Samples

Tab 11 is a compendium of dose assessment methods which can be used to correlate environmental sample media analysis results to a dose commitment. This Tab includes 6 parts:

- Part 1 Child thyroid dose from field measurements on air samples
- Part 2 Child thyroid dose for lab analyses of air samples
- Part 3 Child thyroid/whole body dose commitment due to ingestion of contaminated water, milk, food
- Part 4 Child thyroid dose commitment due to ingestion of contaminated milk--alternate method
- Part 5 Whole body dose rate from standing on contaminated ground
- Part 6 Estimation of offsite surface contamination based on release parameters

2.13 Integrated Dose Assessment

Tab 12 provides a capability to integrate all exposure patheways into a single integrated dose and to perform trend analysis on these results. The methodology encompasses projected dose, measured dose, survey results, ingestion results, and inhalation results at various locations.

3. Derivation

The derivation of the methodologies used in this EPP/IP is documented in Annex G of the EPP/IPs.

E. PROCEDURE

- In the event of a known or suspected airborne release of radioactive materials greater than BVPS Technical Specifications, immediately ascertain if a release did in fact take place (or will take place imminently). If a release did take place, or will take place, proceed with the remaining steps in this procedure.
- 2. Determine the approximate magnitude of the release. Ther dose projections should be performed based on these preliminary estimates and the following criteria:



- 2.1 For all monitored releases in the Unusual Event emergency clasification, dose projections in accordance with this procedure need not be performed as a general rule, due to the minimal offsite significance of such releases. Post-accident evaluation of offsite doses for releases in the Unusual Event category may be necessary to comply with environmental technical specifications. In these cases, the offsite doses may be calculated using the methodology contained in the BVPS Offsite Dose Calculation Manual (ODCM).
- 2.2 For all other releases, dose projection shall be performed.
- 3. Based on the known parameters about the incident, availability of data, and available time, choose the most advantageous X/Q and dose projection calculation method. Use Section D of this procedure for guidance as necessary.
- 4. Determine if the release is elevated or ground level.
- Determine meteorological parameters. If meteorological instrumentation is inoperative, refer to Tab 4 for alternate data sources.
- 6. Determine the X/Q value at the chosen distance in accordance with instructions in the selected tab (Tabs 1 through 4).
- 7. Determine the whole body dose and child thyroid dose in accordance with instructions in the selected tab.

NOTE

(Adult, infant, and teenager thyroid doses may be calculated if time permits, but all protective action recommendations will be based on the child thyroid projected dose, and the whole body dose.)

- 8. Document all calculations on supplied data sheets. Ensure that the date and time are clearly identified on the calculation sheet.
- Continue dose projection activities as long as a release is ongoing or imminent, refining earlier projections if possible.



- 10. Report dose projection results to the following authorities as part of the initial notification and follow-up notifications. These authorities should be notified immediately of any significant change (ie: greater than 100 mrem) in subsequent dose projection results.
 - 10.1 Beaver County Emergency Management Agency
 - 10.2 Columbiana County Disaster Services Agency
 - 10.3 Hancock County Office of Emergency Services
 - 10.4 USNRC (initial notification, and as requested)
- 11. Once the EA & DP area is activated and the offsite agencies are activated, EA & DP personnel will relay significant changes to the following agencies on a continuing basis, with a periodicity consistent with the rate of change and/or the magnitude of the change in assessments. When this interface is established, the agencies listed above will be kept apprised by their respective state agency. Significant dose assessment results and protective action recommendations will continue to be incorporated in initial and follow-up notifications.
 - 11.1 DER/Bureau of Radiation Protection (White phone)
 - 11.2 Ohio DSA/Ohio Dept. of Health
 - 11.3 West Virginia OES/WV Dept. of Health
- 12. Discontinue dose projection activities when:
 - 12.1 The release has been terminated and there is no further release expected, and
 - 12.2 The emergency condition has been terminated by the Emergency Director or Emergency/Recovery Manager.

F. REFERENCES

- Beaver Valley Power Station Emergency Preparedness Plan and Implementing Procedures
- 2. Title 10 Code of Federal Regulations Parts 20 and 50
- "Duquesne Light Company Meteorological Monitoring System" NUS-1539, Volume 1 Revision 3.
- 4. EPA 520/1-75-001, "USEPA Manual for Protective Action Guides and Protective Actions for Nuclear Power Plant Incidents"
- 5. Beaver Valley Power Station FSAR Chapter 14.
- NUREG-0654/FEMA REP-1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

G. ATTACHMENTS

1. Tabs 1 through 12



X/Q VALUES BY XU/Q TABLES

A. PUKPOSE

This tab provides tabular methods for determining the X/Q value at any given distance under various conditions of wind speed and stability class. There is a worksheet provided for ground level release calculations. A method is not provided for elevated releases due to the lower significance of these pathways at BVPS. If an elevated release does occur, the ground level calculation will provide a conservative estimate of downwind dispersion (overestimate), and could be used if the nature of the release can be considered as being elevated (ie: high energy containment failure).

B. PREREQUISITES

- 1. The following meteorological parameters must be known:
 - 1.1 Wind speed (mph) at 35' (analog recorder SDR-MT-600 or Terminet)
 - 1.2 Wind direction at 35' (analog recorder SDR-MT-600 or Terminet)
 - 1.3 Delta-T for 150-35' (analog recorder XR-MT-201 black trace or Terminet)
 - 1.4 The release parameters, as measured on effluent monitors, and/or the accident classification must be known.

C. PRECAUTIONS

- The wind direction as indicated on the analog recorders or the Terminet, and as
 used in reporting meteorological data between the station and offsite agencies
 is the wind direction <u>from which the wind is coming</u>. It is <u>not</u> the direction to
 which the plume is headed.
- Meteorological parameters (ie: wind speed, wind direction, delta-T) at elevations other than those specified herein, cannot be substituted for the parameters at the specified elevation without error in most cases.
- 3. Because of the complex terrain surrounding the Beaver Valley Power Station, it is extremely difficult to calculate "true" atmospheric dispersion in a hand calculational method. This method expressed in this tab is generally based on the guidance of Regulatory Guide 1.145 and incorporates a straight-line Gauss.



ian model. Since plume transport is unlikely to be "straight-line" because of the terrain, this method establishes the upper limit of the dispersion value, regardless of direction. The actual X/Q value applicable to any given point would likely be lower.

D. PROCEDURE

- 1. Using attachments 1 and 2 to this tab, determine the appropriate ground level dispersion factor (X/Q) for the site boundary initially, and other downwind distances as necessary based upon consideration of the wind speed, magnitude of the release, precipitation, population density, etc. If the site boundary dose commitment calculated using the derived X/Q exceeds the protective action levels of EPP/IP-4.1, the X/Q (and associated dose commitment) at the 2 mile radius, and other distances as necessary, shall be calculated.
- 2. If the 150-35' delta-T is unavailable due to instrument malfunction, refer to Tab 4 of this EPP/IP for sources of alternative meteorological data. When such data is obtained, determine the <u>equivalent</u> delta-T as follows:

Where: [emperature high = temperature measured at elevh; Temperature low = temperature measured at elev].

 Document the X/Q value determined on the worksheet. This value can be used in one of the dose calculation methods provided in latter tabs to this EPP/IP.



X/Q WORKSHEET

Observed 35' wind speed: _____ (analog recorder SDR-MT-600 or Terminet)

Observed 150'-35' Stability Class: _____ (See instructions below, or Terminet)

Xu/Q Values for Selected Distances

Stability	EAB	2 mile	5 mile	10 mile
ABC	1.2 E-4	4.5 E-6	7.2 E-7	1.8 E-7
D .	5.5 E-4	4.7 E-5	1.2 E-5	4.4 E-6
Ε	9.3 E-4	9.9 E-5	2.8 E-5	1.1 E-5
FG	1.5 E-3	2.2 E-4	6.7 E-5	2.8 E-5

INSTRUCTIONS

- Observe and record the 35' elevation wind speed, in miles per hour, as indicated on the Terminet, or on analog recorder SDR-MT-600.
- 2. Determine the stability class appropriate for the 150'-35' elevation. The stability class can be directly read off of the Terminet print-out. Alternately, the stability class can be determined from the multi-point analog recorder XR-MT-201, as follows:



- 2.1 Remove the plastic stability class overlay from the ECC controlled copy of this procedure. (Other copies have a paper reproduction of the overlay. If the overlay is not available, the delta-T range appropriate to each stability class is identified on the graph attached.)
- 2.2 Open the recorder bezel and place the overlay over the chart paper, aligning the zero on the overlay with the scale zero on the recorder paper.
- 2.3 Note the latest (topmost) black (pen 1) trace on the recorder in relation to the delta-T $_1$ (Δ T $_1$) stability scale on the overlay. This is the stability class.

NOTE

The chart paper, recorder scale, and the overlay have two delta-T scales -- one for 150'-35' (ΔT_1) and one for 500'-35' (ΔT_2). Ensure that the ΔT scale (-4 to +8) are being used.

- 3. Only four stability classes are used for emergency purposes. Terminet classes A, B, and C, are represented as class ABC. Terminet classes F and G are represented as class FG. Record the stability class.
- 4. For the site boundary (EAB) location initially, and for other distances if the site boundary dose commitment indicates the need, determine a value of X/Q as follows. Note that the dose commitment is at a maximum at the site boundary and decreases with distance.
 - 4.1 Using the stability class recorded in step 3, identify the values of Xu/Q for the distance specified from the provided, or for other optional distances using attached graph. Record these Xu/Q values in the spaces provided.
 - 4.2 From step 1, record the current wind speed in the space provided for each distance to be evaluated.
 - 4.3 Divided the Xu/Q value by the wind speed to obtain the value of X/Q. Record these X/Q values in the space provided for each distance.

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DOSE PROJECTION BY HAND CALCULATION BASED ON FSAR ACCIDENT

A. PREREQUISITES

The following must be available for this method:

- Source of Release (type of accident)
- 2. Meteorology information

B. PROCEDURE

- Classify the type of accident which has occurred from the accidents identified on the worksheet. If no accident classification can be made, choose the fuel handling accident.
- 2. Obtain a copy of the worksheet.
- If not already done, enter the distance at which the whole body and thyroid doses are to be calculated in the spaces provided on the worksheet.
- 4. From the X/Q worksheet (EPP/IP-2.6 Tab 2; EPP/IP-2.6.1 Attachment 1), transfer the X/Q value for the desired downwind distance in the appropriate space on the worksheet.
- 5. Multiply the X/Q value by the correction factor for that accident, for both whole body and child thyroid dose (if applicable), to obtain the projected dose rate at the EAB. Enter the projected dose(s) in the space(s) provided.
- 6. For each additional distance to be calculated, enter the distance (if not already entered) at which the whole body and thyroid doses are to be calculated and enter the appropriate dose factor in the spaces provided on the worksheet. Repeat steps 4 and 5 for each additional distance. Use the reverse side of the form for any additional distances.
- Enter the date, time, and initials of the person who performed the calculation in the spaces provided. Retain this form for subsequent review and evaluation.

5



8. If the thyroid dose to another age group is desired, multiply the child thyroid dose by the appropriate conversion factor below, otherwise ignore this step. (Child thyroid dose is reported to state and local authorities, and protective actions are based on the child thyroid values.)

Accident	Multiply 0 Adult	Child Thyroid Teen	Dose by:
Main Steam Line Break	0.69	0.86	0.92
Fuel Handling Accident	0.73	0.90	0.91
LOCA	0.67	0.85	0.92
S/G Tube Rupt.	0.69	0.86	0.92

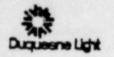


Date:	
Time:	
Name:	

	ACCEPTANT	X/Q ¹		Dose Factor		DOSE, rem
	ACCIDENT	X/Q-	Whole Body Child Thyroid			
	V-1	4.17		1.99 E1		
	Volume Control Tank Rupture		X	Negligible	=	negligible
SIT	C S T L D			1.68		Whole Body Child Thyroid
TE	Gas Surge Tank Rupture		X	Negligible	=	Negligible
B 0	S/C Tuba Puntuna			1 42 E2		
UN	S/G Tube Rupture		X	1.69 È3	=	
0 1	Main Stand Line Book			2.87 E-2		
R Y (RAB, .38	Main Steam Line Break		X	2.3 E2	=	
	Fuel Handling Assistant			1.12 E4		Mhole Body Child Thyroid negligible Negligible Negligible DOSE, rem Whole Body Child Thyroid
	Fuel Handling Accident		X	1.87 E5		
	Loss of Coolant Accident		v	2.8 E3		
=	Loss of Coolant Accident		X	8.25 E4	=	
	DESTANCE	X/Q ¹		Dose Pactor 2		DOSE, rem
	DETAILOR .	A/4-	Whole Body Child Thyroid			Child Thyroid
	2 Mile		x		=	
	5 Mile		x		=	
	10 Mile		x -		= -	
	Other miles		x		=	

¹ From TAB 2

² From blocks above.



EPP/IP-2.6 Tab 6 Attachment 1 (Reverse)

Date:	
Time:	
Name:	

DISTANCE	X/Q ^{II}		Dose Factor 2 Whole Body Child Thyroid		Whole Body Child Thyroid	
		x		=		
		x -				
		x -		=		
		x		=		
		х -		=		
		x -		=		
		x -		= -		
		x		= -		
		x -		= -		
		x -		= -		
		x		= -		

From EPP/IP-2.6 Tab 2; EPP/IP-2.6.1 Attachment 1
 From front

Issue 6 Rev 5



DOSE PROJECTION BASED ON MONITOR READINGS

A. PREREQUISITES

The following data must be available for this method:

- Source of release (type of accident)
- Effluent monitor reading (RM-GW-108B, -VS-101B, -VS-107B, -GW-110, -VS-111, and/or -VS-112), in cpm.
- 3. Effluent flow rate (FR-GW-108, -VS-101, and/or -VS-112), in cfm.

-or-

4. Steam generator relief valve release rate, in Ci/sec, from Radcon Emergency Operating Procedure REOP-1.2.

NOTE

The result of this calculation is a dose rate, which when multiplied by the release time results in an projected dose. It is highly unlikely that the monitor count rate, in cpm, will remain constant throughout the release period. For this reason, it will be necessary to periodically repeat this calculation as the count rate changes. The sum of these individual calculated projected doses is the projected integrated dose for the release. Avoid calculating doses on the basis of monitor spikes, unless the spike lasts long enough to have a significant release time associated with it. Average monitor readings are preferable in order to avoid over-conservative results.

B. DISCUSSION

This tab provides a method to convert monitor reading into projected offsite dose for several postulated accidents. The release rate, in Ci/sec, is determined first from monitor readings and effluent path flow rate. Graphs for this conversion are positive for the various classes of accidents and monitors available. Once the release rate is known, graphs of dose rate versus X/Q and release rate for the analyzed accidents convert the release rate to dose rate. For those analyzed accidents where radioiodine constitutes a significant portion of the release, two graphs are provided—one for whole body, and another for child thyroid. Conversion factors within this procedure convert child thyroid dose to adult, teenager, and infant thyroid dose, should this be desired. The worksheets provide the numerical conversion factors upon which the graphs were based, and if the user prefers, these may be used in lieu of the graphs determine projected dose.



C. PROCEDURE

If the graphical method is to be used, proceed to step 15, otherwise proceed as follows:



1. Classify the type of accident which has occurred from the accidents identified on the worksheet. If no accident classification can be made, choose the fuel handling accident. If fuel damage is suspected, use the LOCA conversions, regardless of the release pathway or initiating accident.



5

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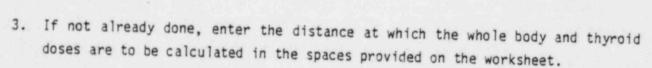
2. Obtain a copy(s) of the worksheet appropriate to the calculation. There are three different worksheets and copies of each are available in the emergency cabinets in the NSS office and EA & DP area.

2.1 Attachment 24 For use with RM-VS107/GW108

2.2 Attachment 25 For use with RM-VS112/GW110 (LR)

2.3 Attachment 26 For use with RM-VS112/GW110 (HR)

The above three worksheets have the appropriate conversion factors preprinted on the form. The form below is a general form, without the preprinted data, which can be used as a continuation to one of the forms above.



NOTE

The monitor and dose conversion factors are both based on the FSAR-postulated source term for each particular accident. If release rates in Ci/sec or similar terms, either gross or isotopic, become available from other indications or methods (ie: REOP-1.1), Tab 8 should be used to project dose commitment.

4. Record the actual count rate on the indicated monitor in block a on the worksheet.





5. Record the actual release flow rate (cfm) as indicated on the specified instrument in block b. If the flow rate is not immediately available, assume the follow flow rates (based on test data):

Process Vent (GW-108)	1000 CFM
Ventilation Vent (VS-101)	60,000 CFM
SLCS (Normal line-up)(VS-107)	33,500 CFM
SLCS (Emerg. line-up)(VS-107)	42.500 CFM

- 6. Transfer the X/Q value applicable to the present meteorological conditions and the dose point of interest from the X/Q worksheet (Tab 2 Attachment 1-EPP/IP-2.6.1 Attachment 1). Record this value in block e.
- 7. From the table on the worksheet, enter the appropriate monitor cpm to release rate conversion factor in block c.
- 8. Multiply the observed monitor reading (block. a) by the release flow rate (block b). Multiply the result by the conversion factor (block c), and record the release rate in block d.
- 9. From the table on the worksheet, enter the applicable dose conversion factors in the appropriate block f -- the upper value for whole body, the bottom value for the child thyroid.
- 10. Multiply the calculated release rate (block. d) by the observed X/Q (block. e). Multiply this result by the whole body dose factor (block f top) and record the dose rate in block g (top).
- 11. Multiply the block (d) x (e) value by the child thyroid dose factor (block f lower) and record the result in block h (lower).
- 12. Determine, or project, the duration of the release at the current release rate. Record this value on the worksheet in block h. If a reasonable estimate of the duration is unknown, use one hour for the initial projection, and update the projection appropriately as better data becomes available.
- 13. Multiply the individual dose rate(s) (block g) by the release duration (block h), and record the projected dose(s) in block i.



- 14. If the dose commitments for other downwind distances are desired for the same instrument readings, repeat steps 6 through 13, using the spare blocks, for each additional distance desired. If the instrument readings change, obtain a new worksheet, and rework the solution completely.
 - 14.1 If the thyroid dose to another age group is desired, multiply the child thyroid dose by the appropriate conversion factor below, otherwise proceed to step 18. (Child thyroid dose is reported to state and local authorities, and protective actions are based on the child thyroid values.)

Accident	Multiply Adult	Child Thyroid Teen	Dose by: Infant
Main Steam Line Break	0.69	0.86	0.92
Fuel Handling Accident	0.73	0.90	0.91
LOCA	0.67	0.85	0.92
S/G Tube Rupt.	0.69	0.86	0.92

- 15. If the graphs are to be used, proceed as follows:
 - 15.1 Locate the graphs associated with the identified accident and remove them from the procedure book. Each graph is marked on the upper right hand corner with the name of the accident to which it applies and/or the monitor to which it applies. The table below can be used as a guide.
 - 15.1.1 If the accident is a steam generator tube rupture, first determine the Ci/sec release rate using Radcon Emergency Operating Procedure REOP-1.2, "Emergency Use of the Atmospheric Steam Relief Effluent Monitoring System.

Accident Type	Monitor to Monitor	Ci/Sec Graph	Ci/sec to Do Organ	se Rate Graph
Volume Control Tank Rupture	VS-107 VS-112 L/R VS-112 H/R	Att. 1 Att. 7 Att. 13	Whole Body	Att. 14
Gas Surge Tank Rupture	VS-107 VS-112 L/R VS-112 H/R	Att. 2 Att. 8 Att. 13	Whole Body	Att. 15
Main Steam Line Break	VS-107 VS-112 L/R VS-112 H/R	Att. 3 Att. 9 Att. 13	Whole Body Child Thyroid	Att. 16 Att. 19

Accident Type	Monitor to		Ci/sec to C	Dose Rate
Accident Type	Monitor	Graph	Organ	Graph
Fuel Handling Accident	VS-107 VS-112 L/R VS-112 H/R	Att. 4 Att. 10 Att. 13	Whole Body Child Thyroid	Att. 18 Att. 21
Loss of Coolant Accident	VS-107 VS-112 L/R VS-112 H/R	Att. 5 Att. 11 Att. 13	Whole Body Child Thyroid	Att. 17 Att. 20
Waste Gas Decay Release	GW-108 GW-110 L/R GW-110 H/R	Att. 6 Att. 12 Att. 13	Whole body	Att. 15
Steam Generator Tube Rupture	From REOP-1.2		Whole Body Child Thyroid	Att. 22 Att. 23

- 15.2 Locate the monitor to release rate conversion graph for the monitor of interest.
- 15.3 On the left vertical axis, locate the monitor reading, in cpm. Sight across the graph to the oblique line associated with the observed flow rate. Interpolate between lines if necessary. Sight down to the lower horizontal axis and read off the release rate, in Ci/sec. Record this value on the worksheet in block d.
 - 15.3.1 If the monitor reading cannot be read on the left vertical axis, locate the reading on the right vertical axis, sight across to the flow rate, and then upwards to the upper horizontal axis. The bent arrows located adjacent to the vertical axis indicate which horizontal axis is associated with that vertical axis.
 - 15.3.2 If the release rate cannot be read off the graph, the Ci/sec per cpm per cfm conversion factor is provided on the lower left hand corner of each graph.
 - 15.3.3 Attachment 13 provides for all accident conditions. For this graph, it will be necessary to correct the indicated Ci/sec result by the actual flow rate. In addition, some of the accident lines provide multipliers by which the indicated Ci/sec should be multiplied for that particular accident. The conversions are:

Corrected Ci/sec = Graph Ci/sec x Accident Multiplier x $\frac{\text{Actual flow rate}}{\text{Graph flow rate}}$ *From upper right hand corner of graph.

15

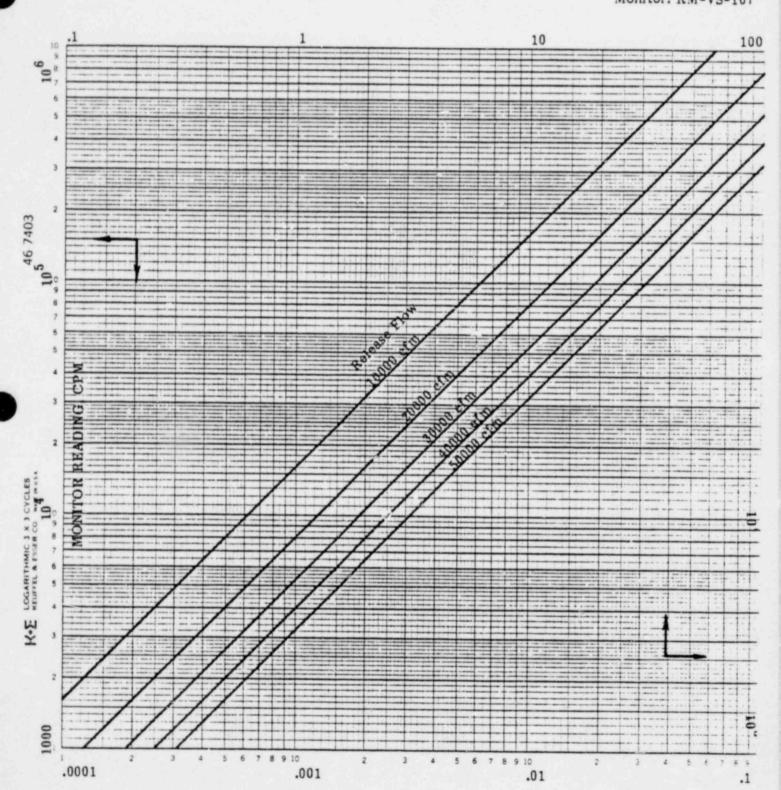
5



- 15.4 Locate the release rate to whole body dose rate conversion graph.
- 15.5 On the left vertical axis (paper short way up), locate the release rate in Ci/sec. Sight across to the oblique line associated with the observed X/Q. Interpolate between lines if necessary. Sight down to the horizontal axis and read off dose rate, in rem/hour. Record this value on the worksheet in block g in the top row. Refer to steps 15.3.1 and 15.3.2 if the desired values can not be found on the graphs.
- 15.6 Repeat steps 15.4 and 15.5 using the graph for thyroid dose if applicable to the accident of interest, recording the result in block g in the bottom row.
- 15.7 Complete the worksheet as described in steps 12 through 14.

MONITOR CPM TO NOBLE GAS Ci/Sec Volume Control Tank Rupture

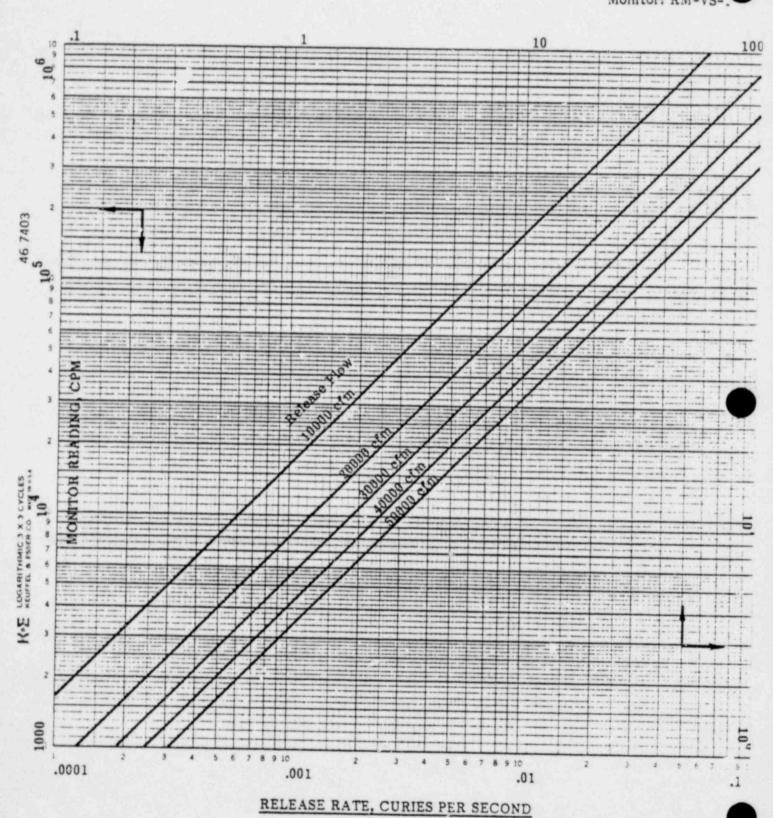
Monitor: RM-VS-107



RELEASE RATE, CURIES PER SECOND

k = 6.19E-12 Ci/sec-cpm-cfm

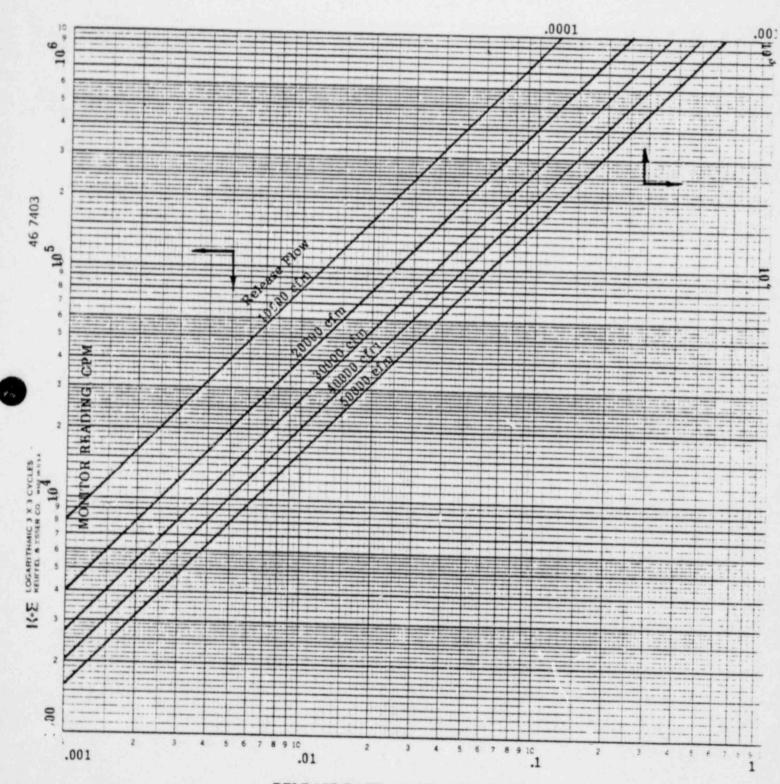
MONITOR CPM TO NOBLE GAS Ci/Sec Gas Surge Tank Rupt Monitor: RM-VS-



k = 6.13E-12 Ci/sec-cpm-cfm

MONITOR CPM TO NOBLE GAS Ci/Sec

Main Steam Line Break Monitor: RM-VS-107

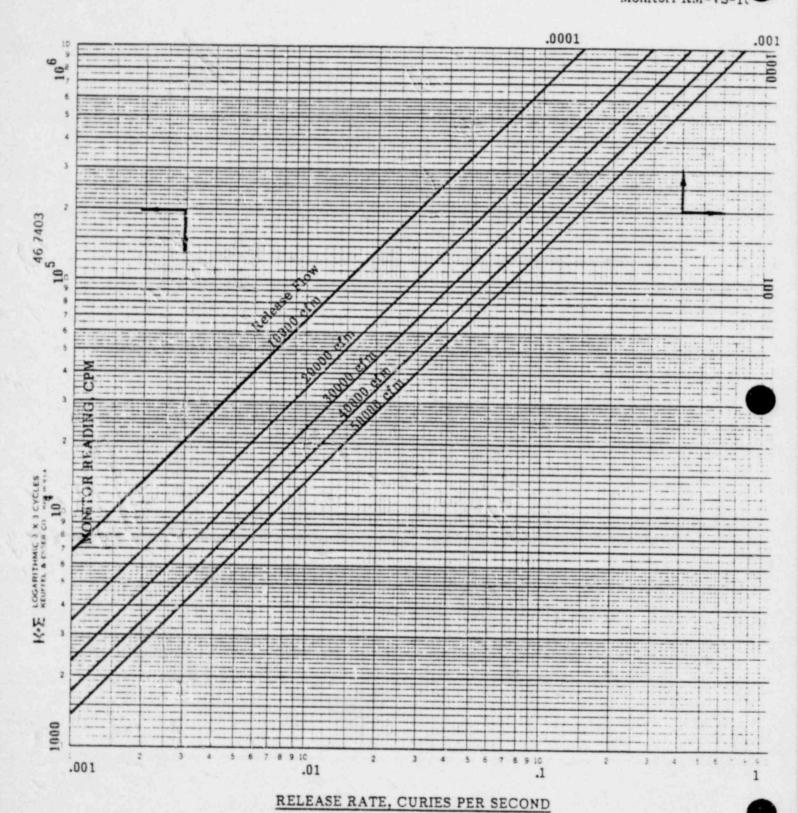


RELEASE RATE, CURIES PER SECOND

k = 1.24E-11 Ci/sec-cpm-cfm

MONITOR CPM TO NOBLE CAS CI/Sec

Fuel Handling Accide Monitor: RM-VS-1

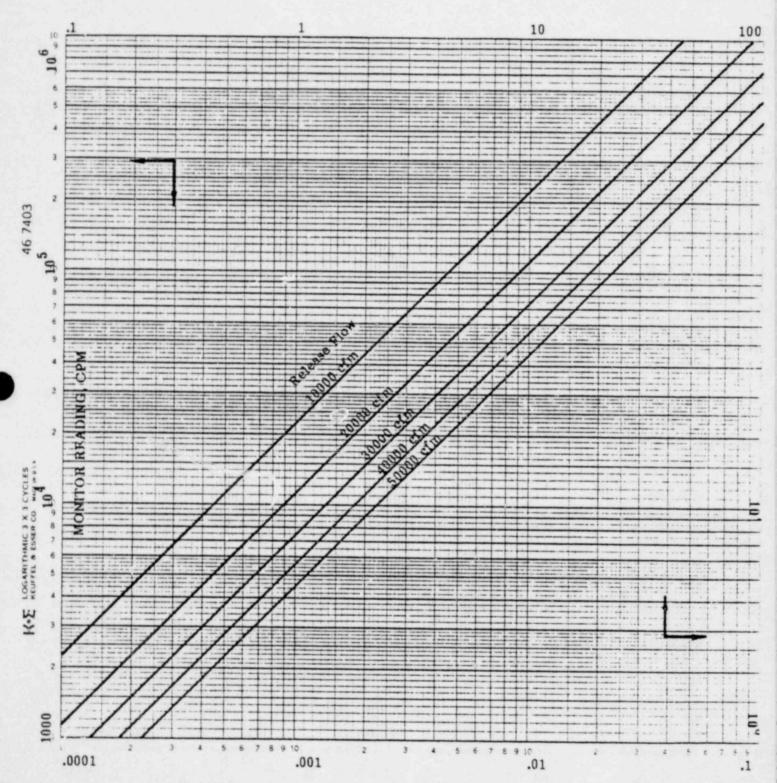


k = 1.47E-11 Ci/sec-cpm-cfm

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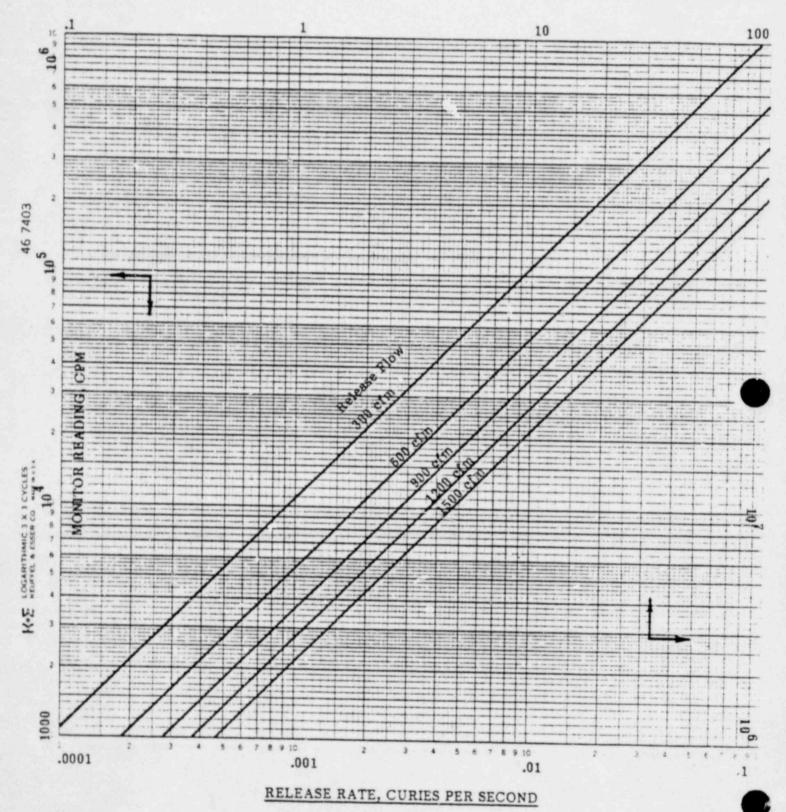
MONITOR CPM TO NOBLE GAS Ci/Sec

Loss of Coolant Accident Monitor: RM-VS-107



RELEASE RATE, CURIES PER SECOND

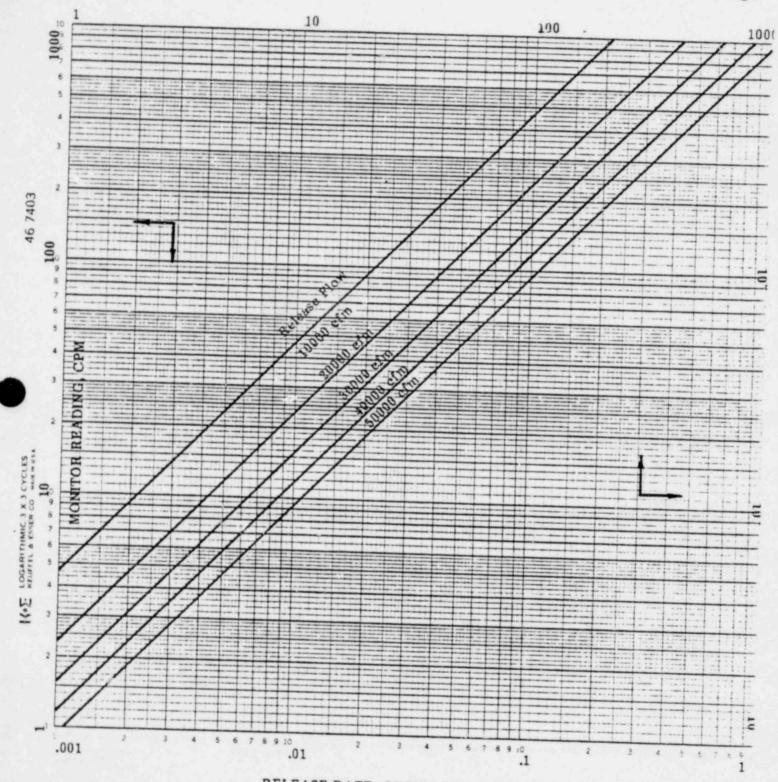
MONITOR CPM TO NOBLE GAS Ci/Sea Waste Gas Decay Tank Relea Monitor: RM-GW-1



k = 3.05E-10 Ci/sec-cpm-cfm

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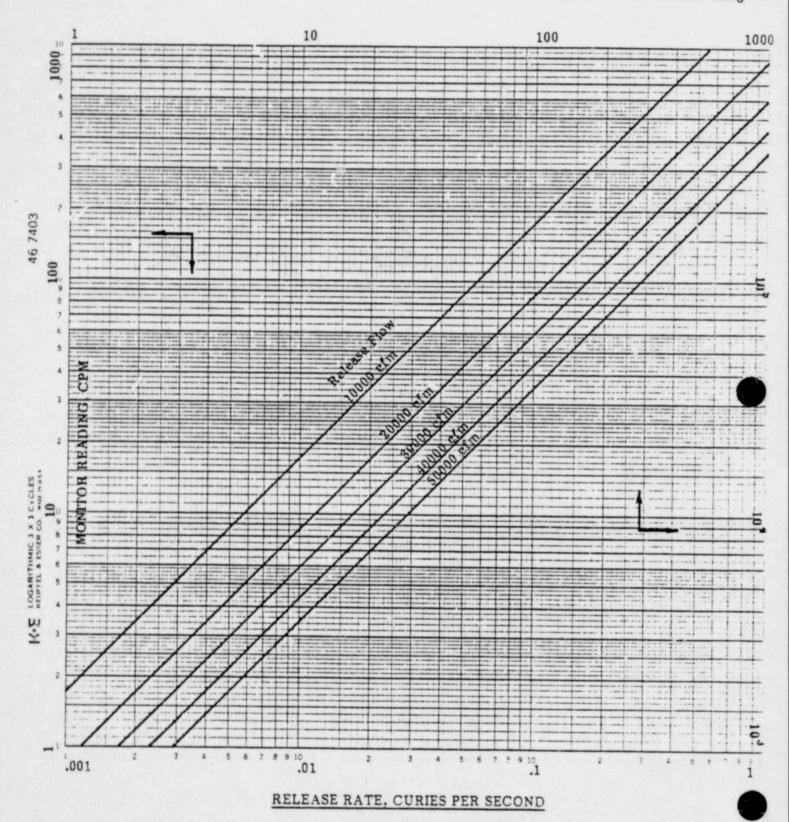
MONITOR CPM TO NOBLE GAS Ci/Sec Volume Control Tank Rupture Monitor: RM-VS-112 Low Range



RELEASE RATE, CURIES PER SECOND

k = 2.12E-8 Ci/sec-cpm-cfm

MONITOR CPM TO NOBLE GAS Ci/Se Gas Surge Tank Ruptu Monitor: RM-VS-112 Low Rang

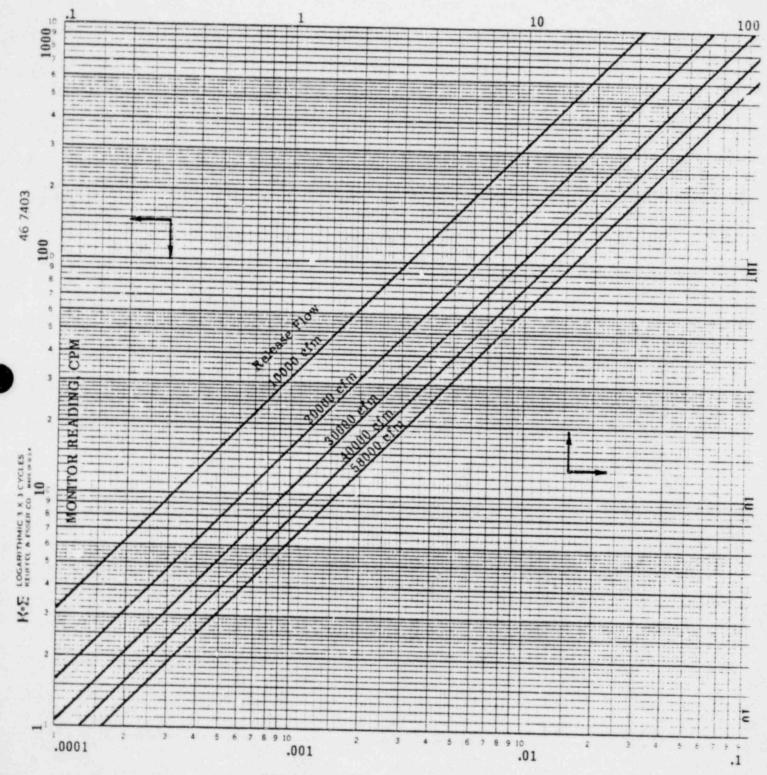


k = 5.71E-8 Ci/sec-cpm-cfm

ISSUE 6 REV 45

MONITOR CPM TO NOBLE GAS Ci/Sec Main Steam Line Break

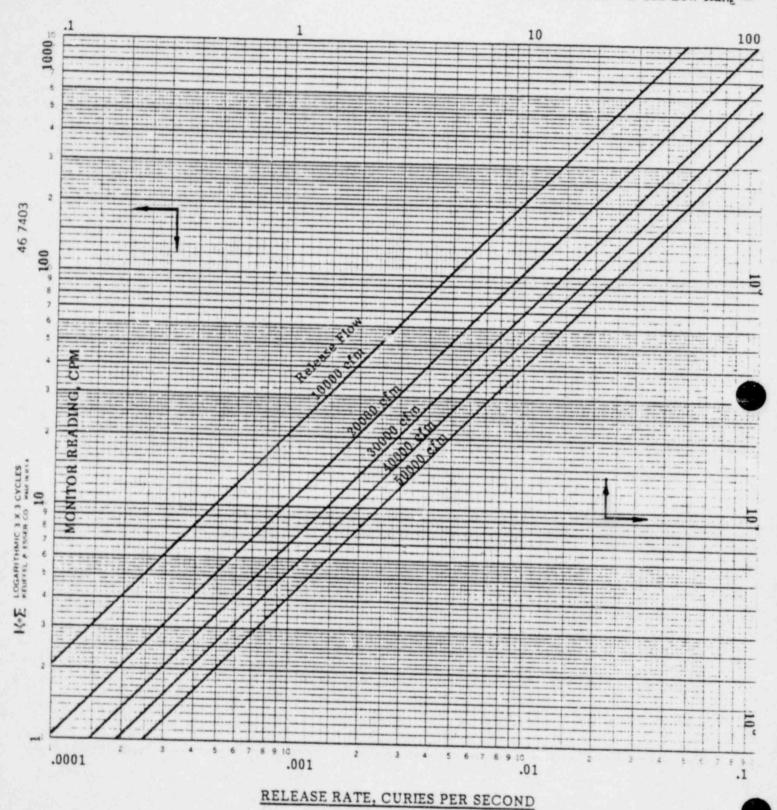
Monitor: RM-VS-112 Low Range



RELEASE RATE, CURIES PER SECOND

k = 3.17E-9 Ci/sec-cpm-cfm

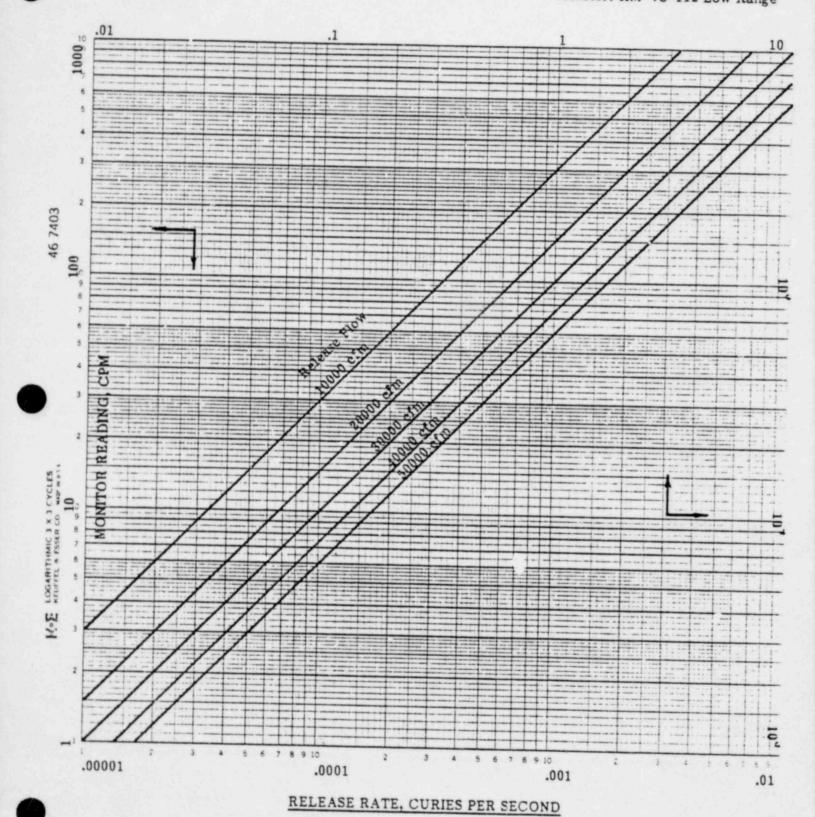
MONITOR CPM TO NOBLE GAS Ci/Sec. Fuel Handling Accide Monitor: RM-VS-112 Low Rang



k = 4.77E-9 Ci/sec-cpm-cfm

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MONITOR CPM TO NOBLE GAS Ci/Sec Loss of Coolant Accident Monitor: RM-VS-112 Low Range

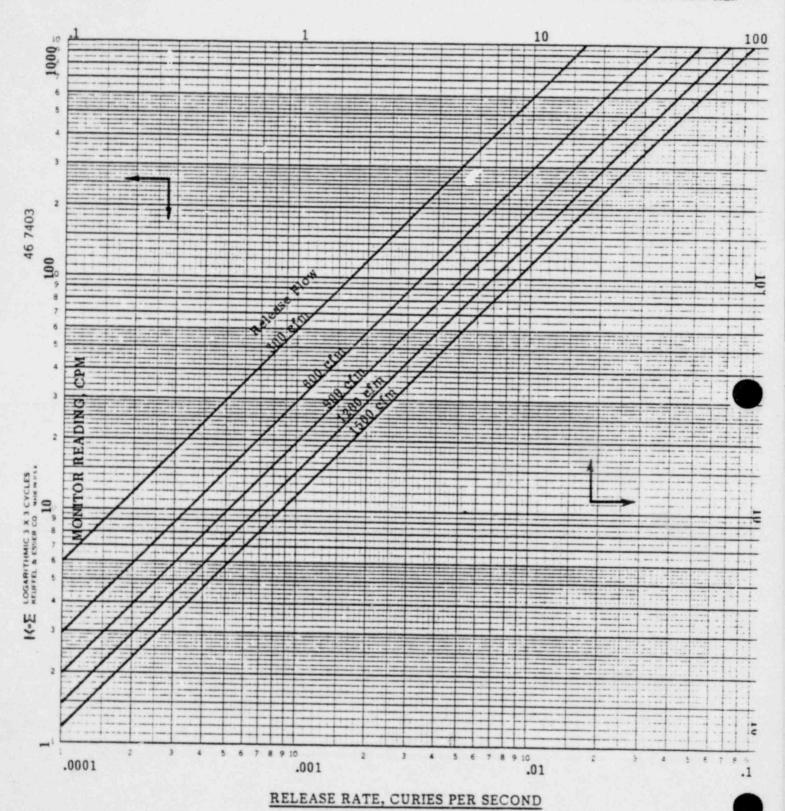


k = 3.32E-10 Ci/sec-cpm-cfm

ISSUE 6 REV \$5

Attachment 12

MONITOR CPM TO NOBLE GAS Ci/Seg Waste Gas Decay Tank Rele Monitor: RM-GW-110 Low Rai



k = 5.71E-8 Ci/sec-cpm-cfm

ISSUE 6 REV 45

EPP/IP-2.6 TAB 7

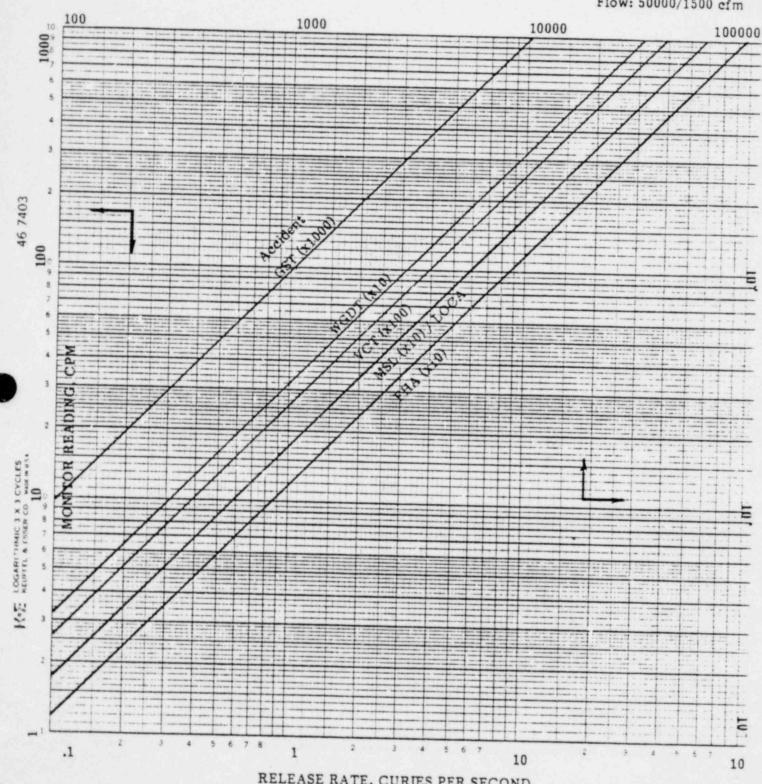
Attachment 13

MONITOR CPM TO NOBLE GAS Ci/Sec

All Accidents

Monitor: RM-VS-112/GW-110 High Range

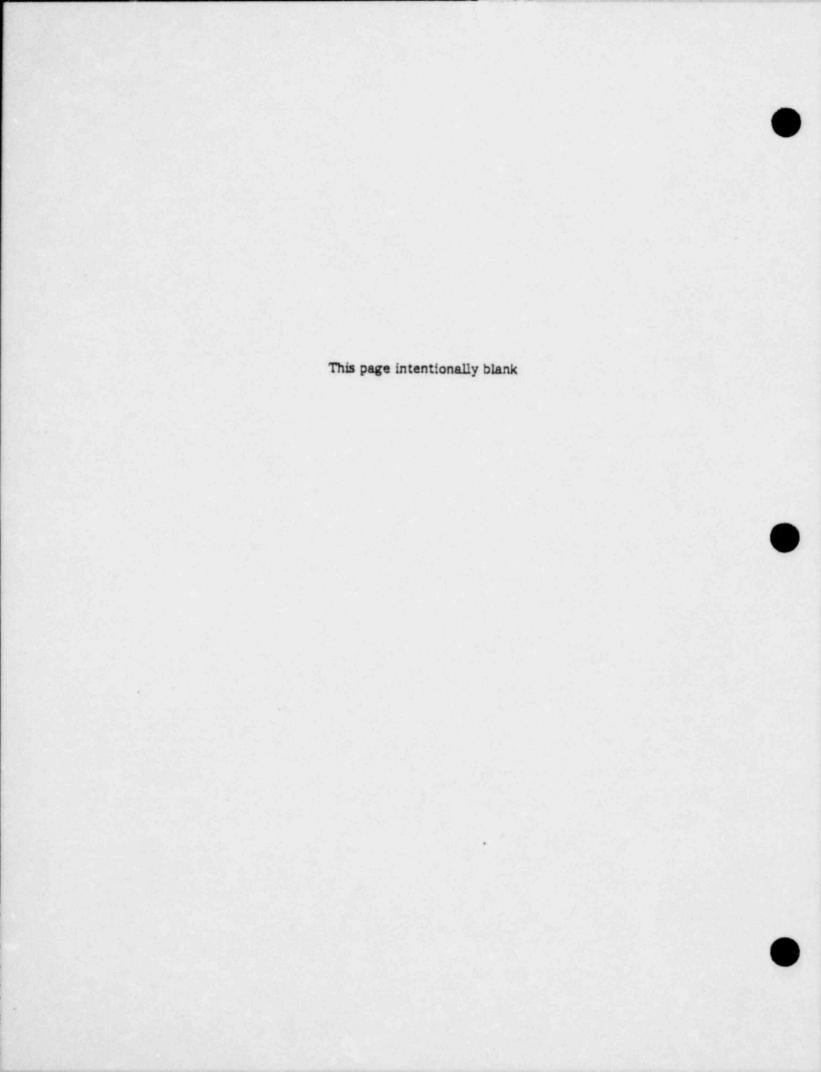
Flow: 50000/1500 cfm

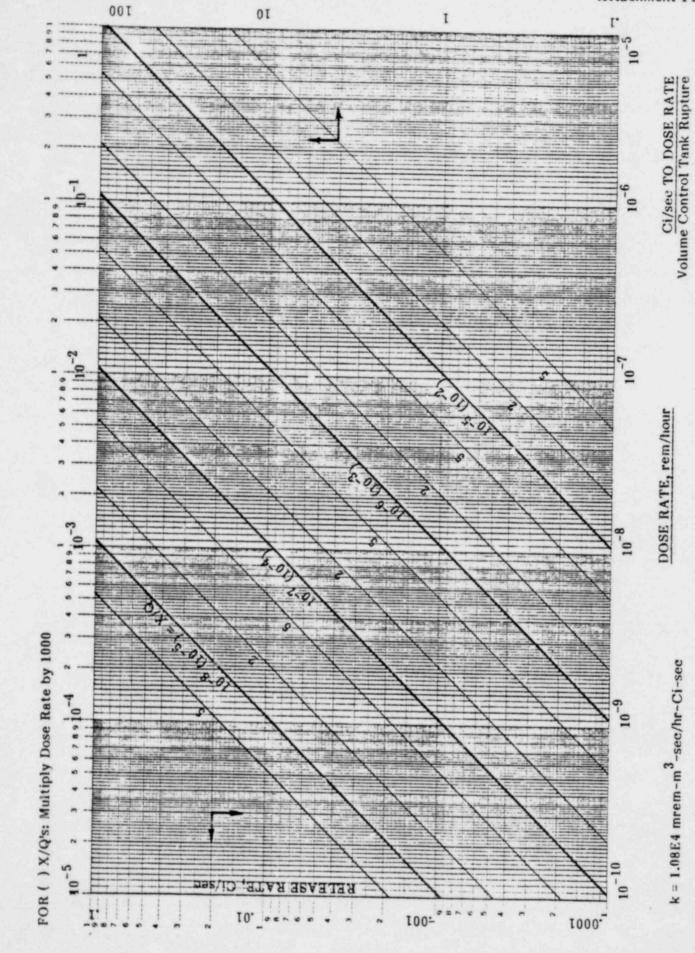


RELEASE RATE, CURIES PER SECOND

Multiply Ci/sec by: 1000 for GST Rupture 100 for VCT Rupture 10 for WGDT/FHA/MSL Break

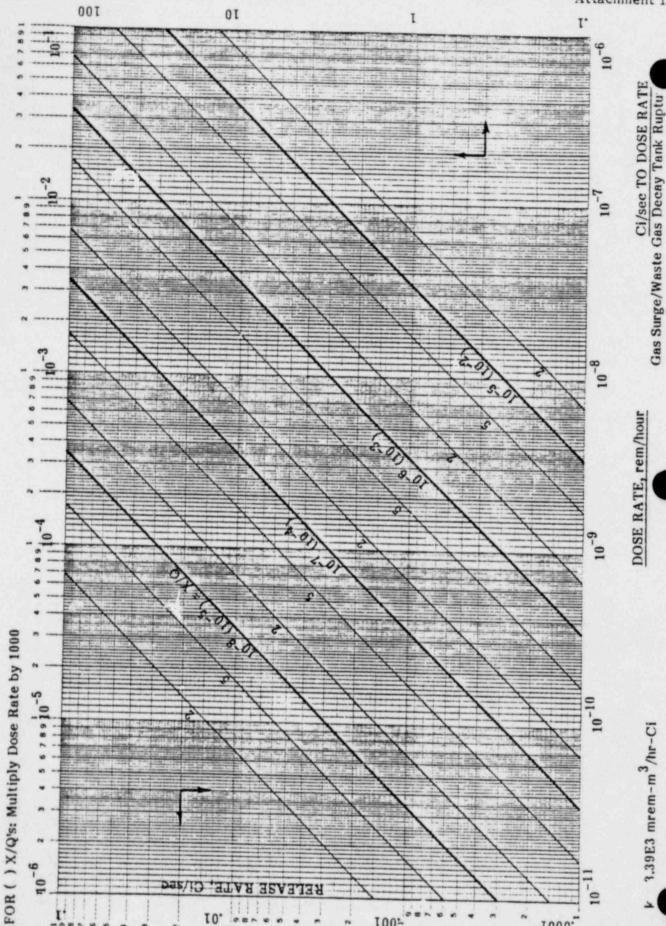
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HOE LOGARITHMIC 3x S CYCLES

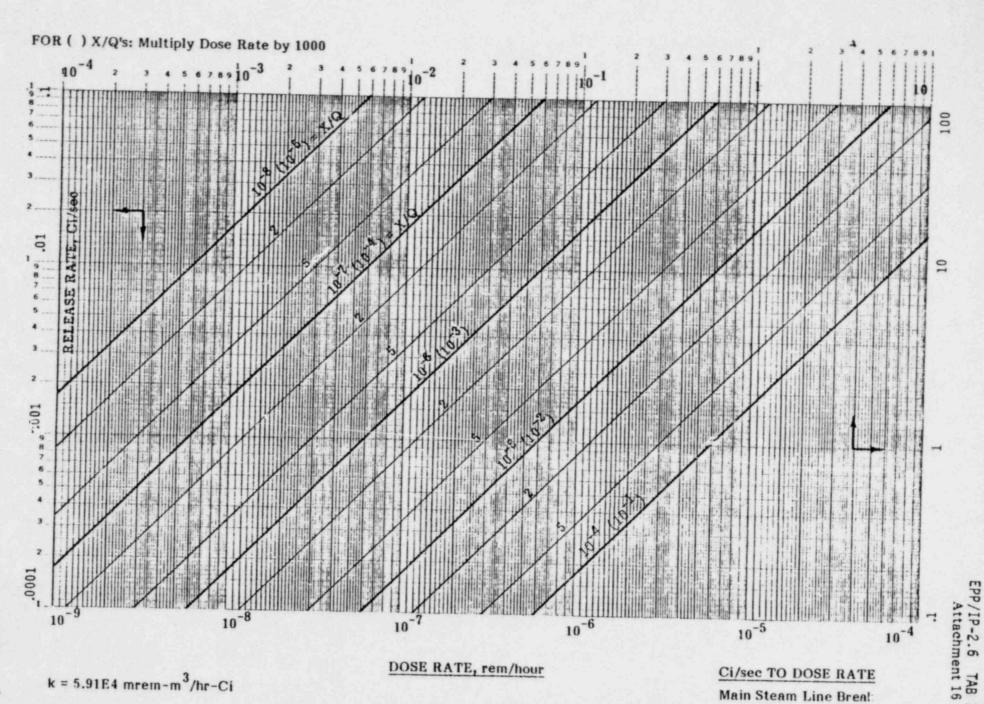


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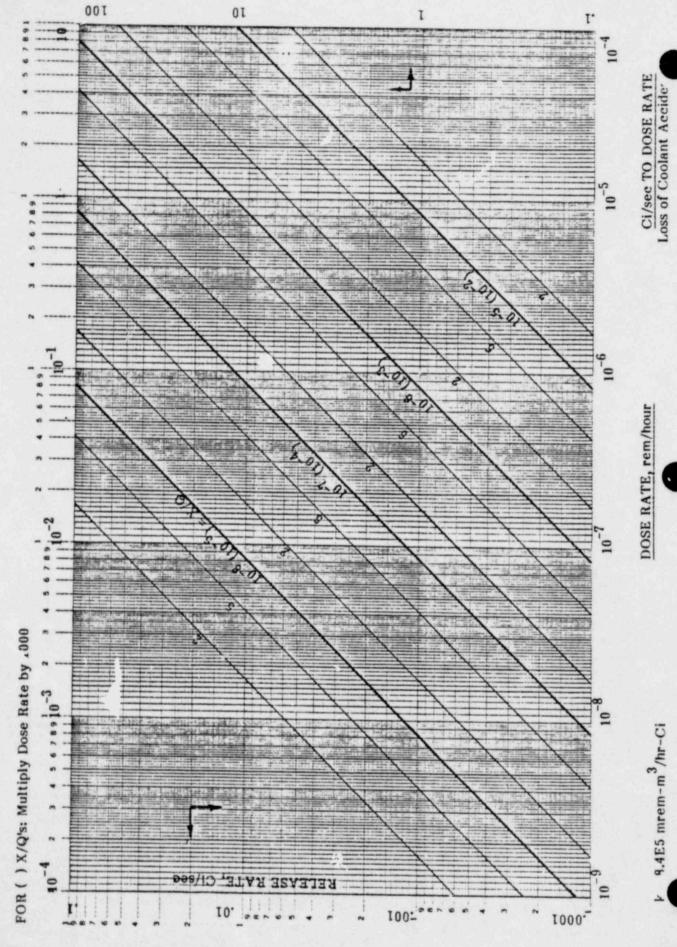
KE LOGARITHMIC 3x 3 CYCLES

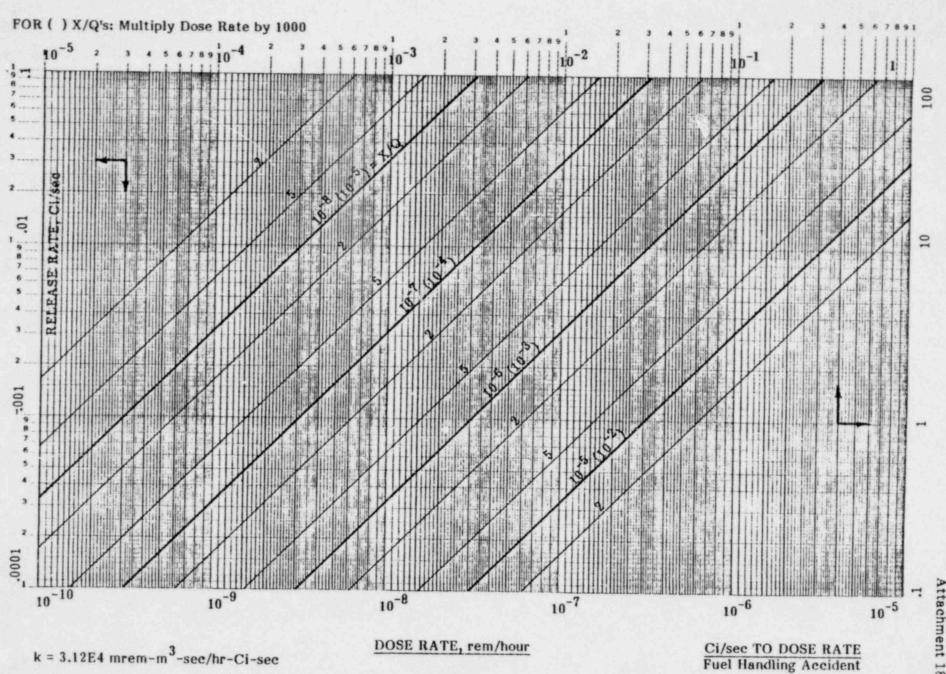
1000-



ISSUE 6 REV 45

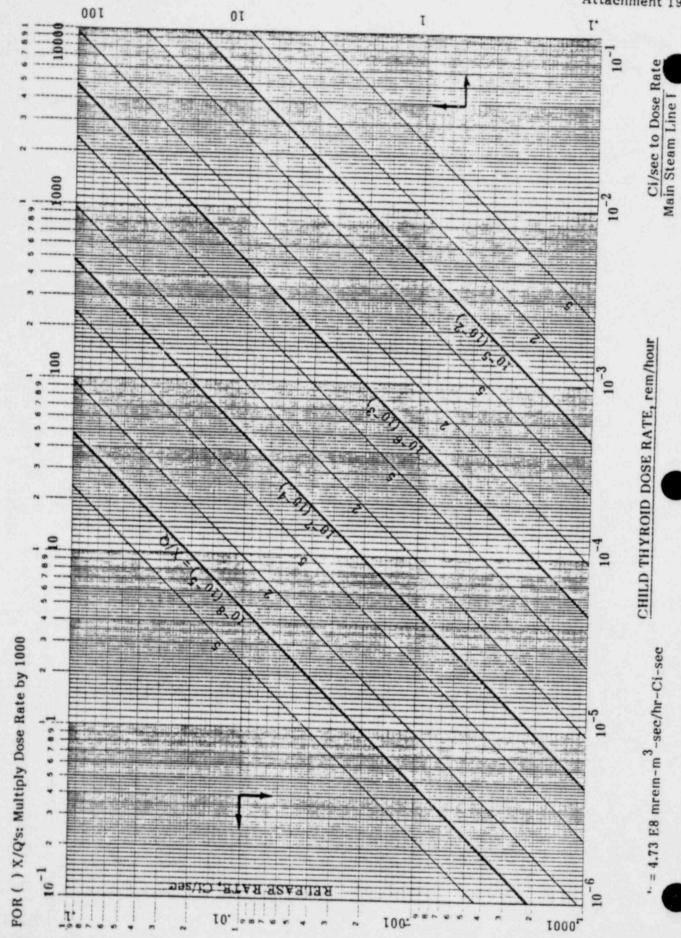
46 7522

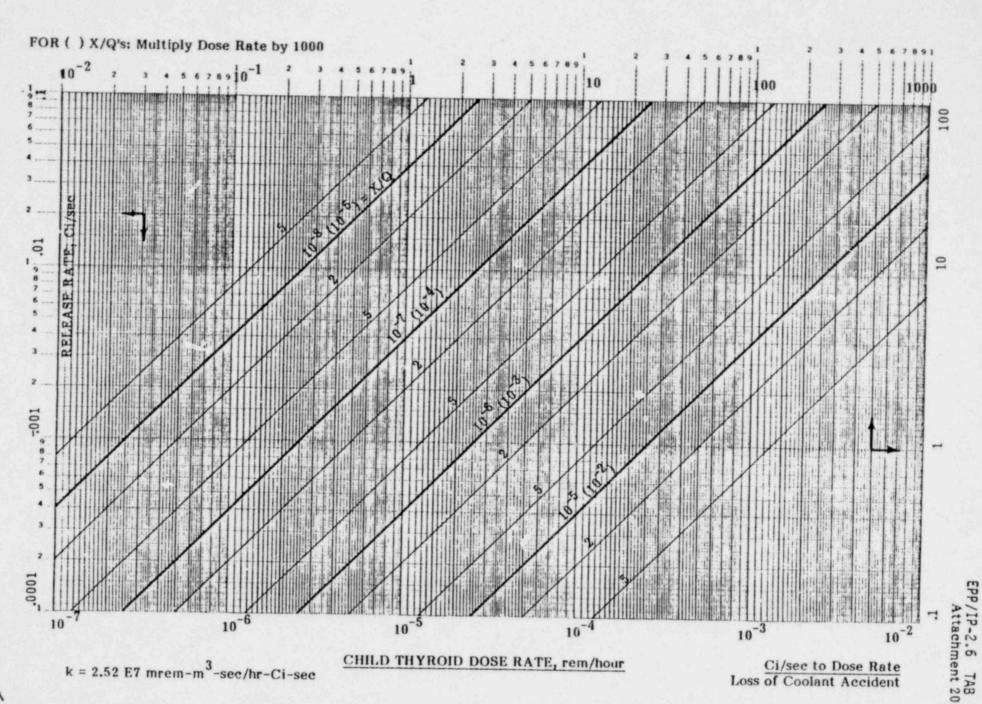




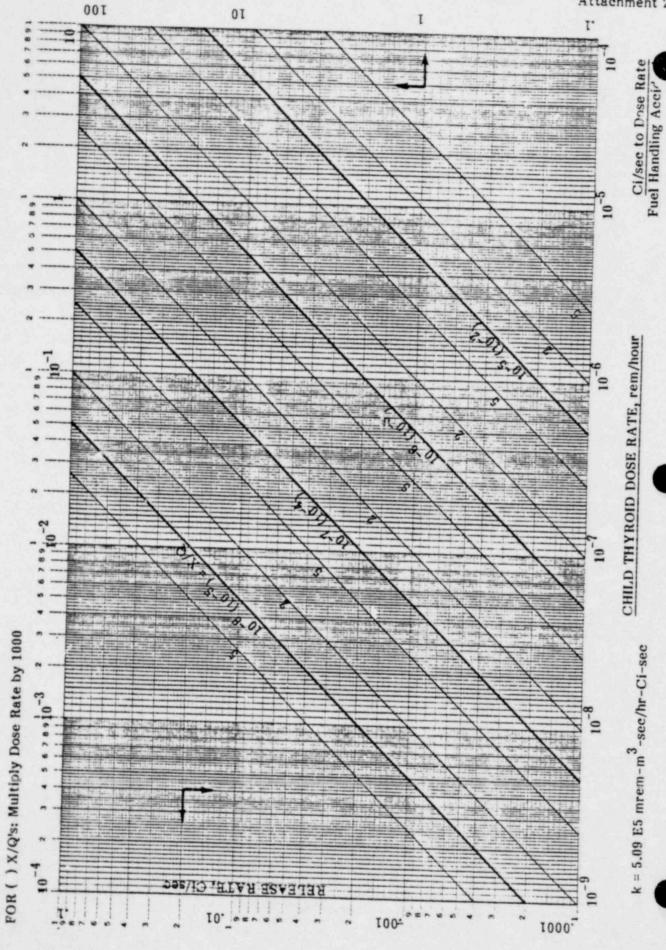
ISSUE 6 REV \$5

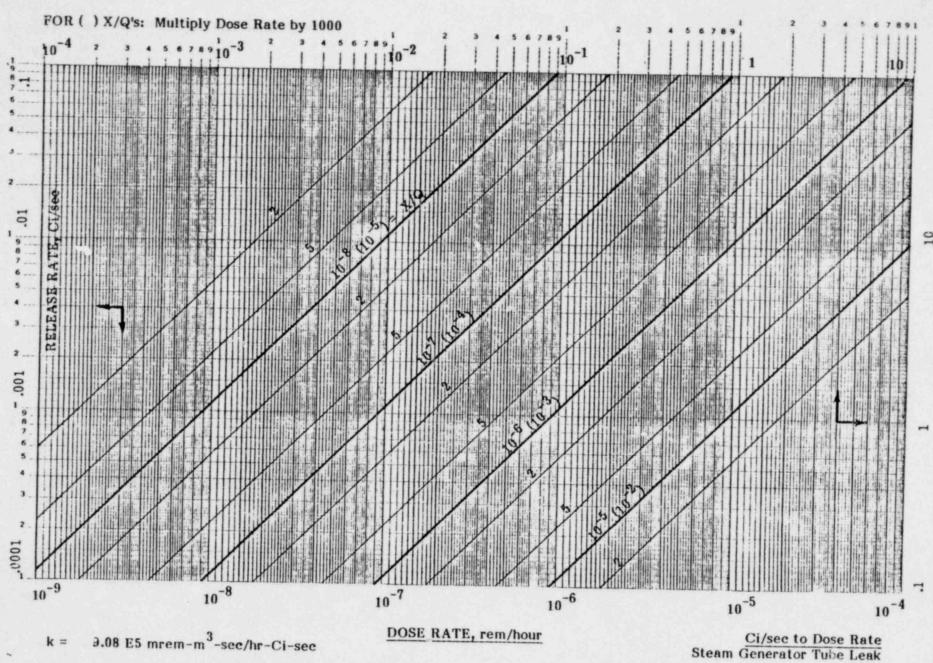
EPP/IP-2.6 TAB 7 Attachment 18 46 7522





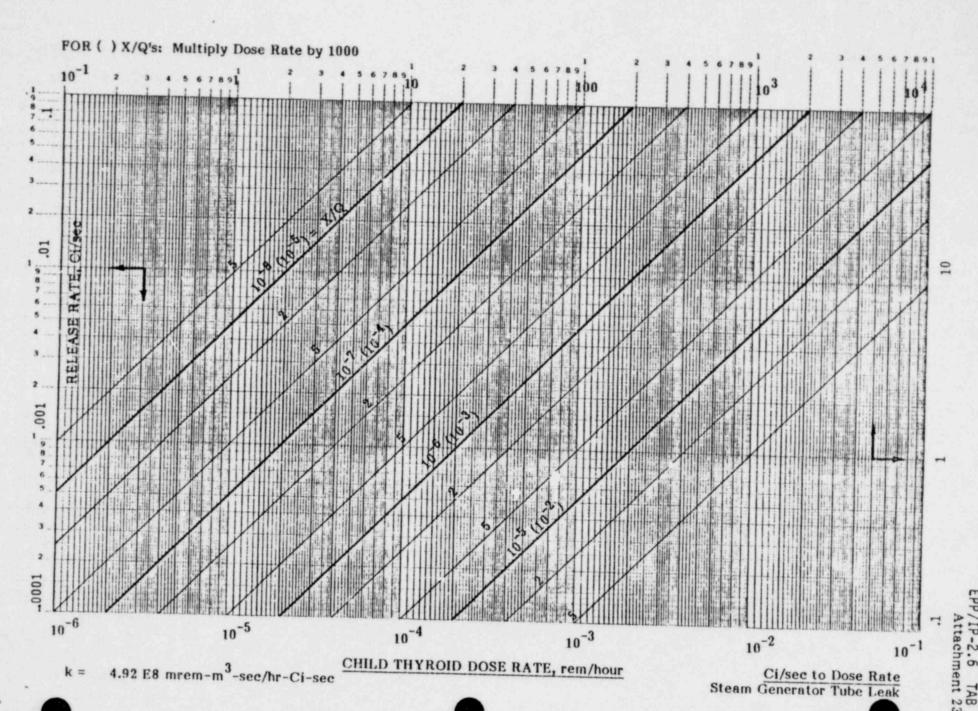
ISSUE 6 REV \$5





ISSUE 6 REV 45

PP/IP-2.6 TAB Attachment 2



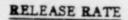
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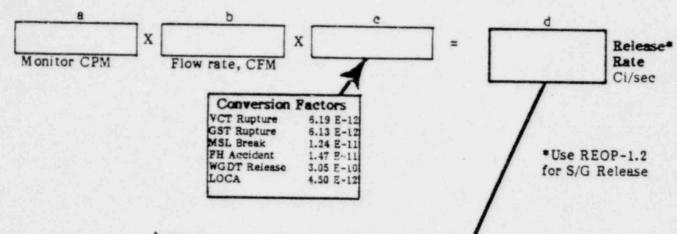


EPP/IP-2.6 Tab 7

Attachment 24

FOR MONITORS RM-VS-107B





DOSE CALCULATION

**From TAB 2

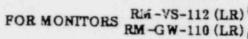
	d		e	T	1	T	g	T	h	T	i
Distance (miles)	Release Rate (Ci/sec)		X/Q** (sec/m³)	-	Dose Factor Whole Body Child Thyr.	-	Dose Rate (R/hr)		Proj. Time (hrs)		Dose (rem)
Site Boundary		x		X		=		x		=	
EAB				X		=		x		2	
2.0		x		X		=		X		=	
				X		=		X		=	
5.0		x		X		=		X		=	
				X		=		x		=	
10.0		x		X		=		X		=	
		^		X		=		x		=	
Other		x		X		=		x		=	
				X		=		x		=	1.584

YCT Rupture	(LOS E1 (Negl.	GST/WGDT Rupt.	(3.39 Negl.
S/G Tube Rupture	(9.08 E2 (4.92 E5	MSL Break	{5.91 E 4.78 E
Puel Handling	(3.12 E1 (5.09 E2	Loss of Coolant	(8.4 E2 (2.52 E

Date:		Time:	am/pm	Name:	
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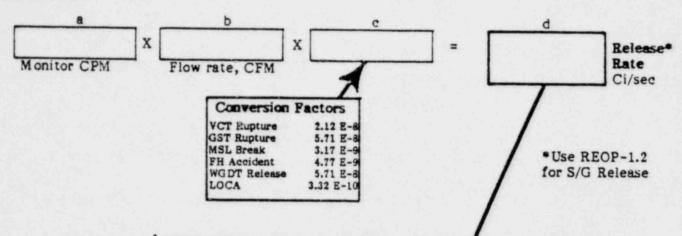


EPP/IP-2.6 Tab 7 Attac ment 25





RELEASE RATE



DOSE CALCULATION

**From TAB 2

	d	-	e		f		g	T	h		i	
Distance (miles)	Release Rate (Ci/sec)		X/Q** (sec/m³)	-	Dose Factor Whole Body Child Thyr.	=	Dose Rate (R/hr)		Proj. Time (hrs)		Dose (rem)	
Site Boundary		x		X		=		X		=		
EAB				X		=		x		=		
2.0		x		X		2		X		=		
		1		X		=		X		=		
5.0		x		X		=		X		=		
		^		X		=		X		=		
10.0		x		X		=		X		=		
10.0		A		x		=		x		=		
Other		x		X		=		X		=		
		A		X		=		x		=		

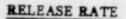
	- Dose	actors -			
VCT Rupture	(1.08 E1 Negl.	GST/WGDT Rupt.	(3.39 (Negl.		
S/G Tube Rupture	9.08 E2 4.92 E5	MSL Break	(5.91 E1 (4.78 E5		
Fuel Handling	(3.12 E1 (5.09 E2	Loss of Coolant	(8.4 E2 (2.52 E4		

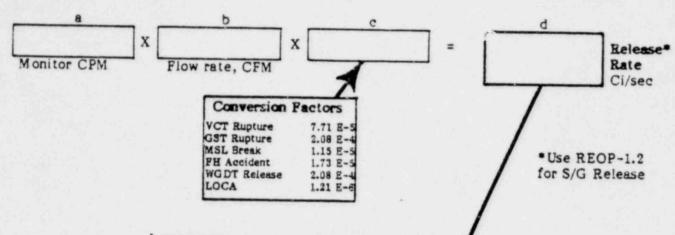
Date: _____ Time: ____ am/pm Name: _____



EPP/IP-2.6 Tab 7 Attachment 26

FOR MONITORS RM -VS-112 (HR)
(SA-9)





DOSE CALCULATION

	d		е		f		g	T	h	T	i	
Distance (miles)	Release Rate (Ci/sec)		X/Q** (sec/m³)	-	Dose Factor Whole Body Child Thyr.	=	Dose Rate (R/hr)		Proj. Time (hrs)		Dose (rem)	
Site Boundary		x		X		=		X		=		
EAB				X		=		x		=		
2.0		x		X		=		x		=		
		"		X		=		x		=		
5.0		x		X		=		x		=		
		"		X		=		x		=		
10.0		x		X		=		x		=		
				X		=		x		=		
Other		x		X		=		х		=		
		-		X		=		x		=		

VCT Rupture	(1.03 E1 (Negi.	GST/WGDT Rupt.	13.39 Negl.
S/G Tube Rupture	(9.08 E2 (4.92 E5	MSL Break	(5.91 E1 4.78 E5
Puel Randling	(3.12 E1 (5.09 E2	Loss of Coolant	18.4 E2 2.52 E4

**From TAB 2

Date:	Time:	am/pm	Name:	



EPP/IP-2.6 Tab 7 Attachment 27

M onitor	a x		b ow rate, CF		xe		=				Release Rate Ci/sec
SE CALCU	LATION d	-	e	_			/		h		i
Distance (miles)	Release Rate (Ci/sec)	1	X/Q** (sec/m³)	-	Dose Factor Whole Body Child Thyr.	+	Dose Rate (R/hr)	1	Proj. Time (hrs)		Dose (rem)
		x		x		=		X		=	
		x		x		=		x		=	
- 1		x		x		=		x		=	
		x		X		=		X		=	
		x		X		=		X		=	
rom Attach	nment 1	3	CT Rupture /G Tube Ruptur uel Handling	e 19	Dose Pactors .08 E1 GST/WG .08 E2 MSL BM .12 E1 Loss of	DT F	(5.91 E	11 15			
e:		_ Ti	me:		am/pm	Na	me:		New Issi	υω/ ue 6	Rev 5

EPP/IP - 2.6 TAB 11 ATTACHMENT 2

LOCATION: (ONSITE) (OFFSITE)	SURVEY ROUTE: (NW) (SW) (NE) (SE)	DISTANCE: (5) (10) miles	DATE:
CALCULATIONS BY:		MONITORING TEAM LEADER	lı

DOSE COMMITMENT FROM AIR SAMPLE DATA - E140/HP210 INSTRUMENT

A	1		e	d	e	1	8	h	1	1	-	T .
Time	Survey Point	Closed Window mR/hr	Parameter	C _s (cpm)	C _b (epm)	C _{net} (cpm)	Sample Volume (ft ³)	Conversion Factor	Cone. (µCI/ce)	Total Cone. (µCl/ee)	Conv. Pactor	Total Dose*
			Air Filter					1.94 E-10			7.73 E5	
			Charcoal					1.35 E-8	-		1.13 E3	
			AgZeolite					6.52 E-10				
1.61			Air Fliter					1.94 E-10			7.73 E5	
			Charcoal					1.35 E-8			1.13 E3	
			AgZeolite					6.52 E-10	-		1 45	
			Air Filter					1.94 E-10	1		7.73 E5	
	V 100		Charcoal					1.35 E-8			1.13 63	
			AgZeolite					6.52 E-10	1			-
			Air Filter					1.94 E-10	1		7.73 E5	
			Charcoal					1.35 E-8	1		1.13 E3	
			AgZeolite					6.52 E-10	1			
			Air Filter					1.94 E-10	1		7.73 E5	
			Charcoal					1.35 E-8	1		7.13 63	
			AgZeolite					6.52 E-10	1			
			Air Filter					1.94 E-10	1		7.73 E5	
			Charcoal					1.35 E-8	1		1.13 63	
			Ag7.eolite					6.52 E-10	1			
			Air Filter					1.94 E-10	1		7.73 E5	
1			Charcoal					1.35 B 8			1.13 E3	
			AgZeolite					6.52 E-10				

^{*}Dose = mrem per hour of inhalation of activity in column j

f = d - e

i = f x h/g (AgZ, charcoal based on I-131, Part. based on Cs-137) i = j x k (based on I-131)

EMERGENCY IMPLEMENTING PROCEDURE

EMERGENCY CONTAMINATION CONTROL

A. OBJECTIVE

During an emergency condition, substantial quantities of radionuclides may be released to the Station or to the environment. As a result, there will likely be an increase in contamination levels. This procedure provides general guidance to the TSC staff to supplement the guidance contained in the Radiation Control Manual (RCM) and/or the Radiation Protection Procedures.

B. PREREQUISITES/INITIAL CONDITIONS

- An emergency condition has been declared at the Beaver Valley Power Station as provided in the BVPS Emergency Preparedness Plan.
- As a result of the emergency condition, significantly abnormal contamination levels are noted.

C. PRECAUTIONS

- Skin contamination less than one (1) rad per hour is unlikely to be immediately life-threatening, and therefore, skin decontamination efforts should never take precedence over necessary first aid.
- 2. Accidents related to fuel degradation and leakage of reactor coolant may result in alpha contamination in addition to the typical beta-gamma radionuclides. If alpha activity is suspected, a random selection of swipes (and air samples) should be counted for alpha activity. The size of the random selection should be decreased or increased on the basis of the initial alpha count results and/or the results of the reactor coolant activity analysis.

D. GUIDANCE AND CRITERIA

1. General

The Beaver Valley Power Station Radiation Control Manual (RCM) contains provisions governing the control of contamination. Chapter 3 of the RCM contains procedures that implement the RCM provisions. The requirements and guidelines



of these documents shall apply to contamination control during emergency conditions except as specifically provided in this EPP/IP, the BVPS Emergency Preparedness Plan, and/or by direction of the Radiological Control Coordinator/Emergency Director.

2. Contamination Control

- 2.1 It may become necessary to extend the boundaries of the controlled area. Appropriate access control and associated contamination control measures shall be established for any area in which contamination exists at levels higher than that ed for a clean area in the RCM.
- 2.2 Personnel and equipment monitoring and release procedures and criteria shall remain in force to the extent possible. There may be exceptions applicable to emergency conditions, as follows::
 - 2.2.1 If background dose rates at normal monitoring locations preclude detection of levels of contamination equivalent to the clean limit, monitoring shall be moved back to a location where this can be done. However, if significant levels of contamination exist, it may be appropriate to perform a gross screening at the exit of grossly contaminated areas, to be followed by a more complete monitoring at a more suitable location.
 - 2.2.2 If dose rates within the contaminated area (or controlled area) warrant an immediate evacuation, personnel monitoring shall not be required prior to evacuation. If possible, personnel exiting such areas should remove any clothing thought to be contaminated, or uon clean coveralls to minimize the spread of potential contamination, pending subsequent monitoring. In this case, appropriate monitoring should be performed at the designated assembly area.
 - 2.2.3 Contamination limits for release of personnel, equipment, and areas specified in the RCM shall remain in effect to the maximum extent possible. The Radiological Control Coordinator will determine when a change in contamination limits is applicable and will

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establish appropriate revised limits. However, under site evacuation conditions, decontamination is normally mandatory if the contamination exceeds 1800 pCi/100 cm².

- 2.3 The conditions under which a Site evacuation would be initiated might involve significant releases with resultant contamination of environmental surfaces offsite. Under these conditions, delaying site evacuation to monitor and/or decontaminate personnel or vehicles would be inconsistent with maintaining exposures as low as reasonably achievable, and may be superfluous in light of the potential for re-contamination offsite. The following procedures should be used:
 - 2.3.1 Personnel should be directed to the upwind remote assembly area for monitoring. Radcon shall monitor personnel on the basis of a screening process to identify contaminants in excess of 1800 pCi/100 cm². Personnel monitoring should basically consist of checking hands, feet, and the face with an E140/HP210 or equivalent survey instrument.
 - .1 Personnel identified as contaminated should be segregated to an area for eventual decontamination.
 - .2 Documentation of the extent and magnitude of the individual's contamination will be performed after the initial segregation phase of the group monitoring.
 - 2.3.2 If both assembly areas are within sectors from which the population is being evacuated, the Emergency Director, in cooperation with DLC management and State and county agencies shall designate an assembly area at which personnel monitoring will be performed. In this event, personnel and vehicles will be monitored the same as members of the general public as provided in the emergency plans of the affected jurisdictions.

- 2.4 For rescue efforts in which there is a potential for the imminent death of the victim, and for which the magnitude of radiological conditions in the affected area are generally known, an emergency squad member(s) should proceed to the scene without protective clothing to assess the situation and render first aid. Other members of the Emergency Squad should don appropriate protective clothing and proceed to the area to assist. The initial emergency squad member(s) should leave the area and be monitored and/or decontaminated as soon as possible.
- 2.5 For fire-fighting efforts, normal fire-fighting gear (helmets, coats, boots, gloves, etc) may take the place of protective clothing. This apparel is as likely to provide protection from contaminated water spray.

Decontamination

- 3.1 Personnel decontamination shall be performed as provided in the RCM and in Radiation Protection Procedures.
- 3.25 Contaminated/injured personnel should be decontaminated prior to transfer to the hospital, if possible, and if compatible with the extent of the injuries. Even a superficial initial decontamination to remove the loose contamination will help minimize the contamination of ambulances and hospital facilities and personnel. Refer to EPP/IP-5.2, "Handling of Contaminated/Irradiated Personnel Injuries".
- 3.3 Most cases of skin decontamination with radioactive materials can be decontaminated by Radcon personnel using methods established in the Radiation Protection Procedures. Refer to RCM Chp #5 REOP-3.1 "Personnel Decontamination -- Serious or persistent Contamination". If the contamination is not removed by these initial methods, if decontamination has resulted in excessive irritation of the skin, or if contamination has entered wounds or body openings, medical assistance should be sought. The urgency of such treatment will depend on the dose rate attributable to the

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contamination. Except in cases of high-level contamination, over about one rad per hour including beta radiation, as measured with an ion-chamber instrument (4-7 mg/cm³ window), there is no urgency to complete skin decontamination. If the skin contamination is the primary health hazard or if persistent contamination remains after decontamination efforts, Drs Wald and Spritzer should be consulted, and the individual transferred to the Presbyterian-University Hospital for evaluation and treatment, at the direction of Drs. Wald & Spritzer. Refer to EPP/IP-5.4.

3.4 Decontamination of persons with significant internal contamination shall be referred to medical personnel at the Prebyterian-Unversity Hospital or the RERP program for evaluation and treatment. In the event of a significant uptake of radioiodine, potassium iodide may be administered in accordance with EPP/IP-3.4, "Emergency Respiratory Protection".

E. PROCEDURE

Procedures for contamination monitoring and decontamination are contained in the RCM, subject to change as identified in Section D of this EPP/IP.

F. REFERENCES

- Beaver Valley Power Station Emergency Preparedness Plan and Implementing Procedures
- 2. Beaver Valley Fower Station Radiation Control Manual
- 3. Title 10, CFR Part 20 and 50
- 4. NCRP Report No. 65, "Management of Persons Accidentally Contaminated with Radionuclides"
- ICRP Publication 28, "The Principles and General Procedures for Handling Emergency And Accidental Exposures of Workers"
- NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiclogical Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

G. ATTACHMENTS

1. None.

EMERGENCY IMPLEMENTING PROCEDURE

EMERGENCY RESPIRATORY PROTECTION

A. OBJECTIVE

In an emergency condition during which airborne radioactivity occurs, normal respiratory protection measures may be inadequate due to increased radioactivity levels, or may be undesireable or unsuitable due to its impairing communication and/or movement. This procedure provides guidance for the use of respiratory protection equipment under those conditions.

B. PREREQUISITES/INITIAL -CONDITIONS

- An emergency condition has been declared at the Beaver Valley Power Station as provided in the BVPS Emergency Preparedness Plan.
- As a result of the emergency condition airborne radioactivity is observed, significant enough to warrant respiratory protection.

C. PRECAUTIONS

- Precautions relative to the normal use of respiratory protection should be observed when respirators are worn during emergency conditions.
- During emergency conditions, substantial respiratory hazards such as toxic gases, steam, flammable gases, and oxygen deficiency may likely be present concurrent with significant radioactivity. Respiratory protection should be assigned considering all of the hazards.
- 3. Respiratory protection equipment significantly impairs vision and communication. In an emergency a reduction in the ability to communicate readily and/or to view instrumentation, etc, may not be acceptable. For these reasons, respiratory protection for emergency workers and control room personnel should not be assigned unless the projected ingestion will exceed 40 MPC-hrs/week, based on the actual airborne radioactivity and the estimated duration of release (or area occupancy). However, airborne activity should be sampled/monitored during this period to detect any significant changes in levels. Appropriate bioassay should be performed as soon as possible following such exposure in accordance with EPP/IP-5.4, "Emergency Personnel Monitoring".



D. GUIDANCE AND CRITERIA

1. General

- 1.1 The Beaver Valley Power Station Radiation Control Manual (RCM) Appendix 6 contains provisions governing the use of respiratory protection equipment. Chapter 3, Part 10 of the RCM contains procedures for the proper use of respiratory protection equipment. The provisions of these documents shall apply to all usage of respiratory protection equipment during emergency conditions except as specifically provided in this EPP/IP or in the BVPS Emergency Preparedness Plan.
- 1.2 Three exceptions to normal respiratory protection are addressed in this procedure. The first is the extension of normal uptake limits, the second is the use of thyroid prophylaxis, and the third is the use of iodine sorbant cannisters on filter respirators. These and other exceptions may be approved by the Radiological Control Coordinator in response to specific emergency conditions.

2. Extension of Normal Limits

- 2.1 Under normal operational conditions the inhalation of radioactive material is limited by regulation to 40 hours per week for 13 weeks at the MPCs values specified in Table 1, Column 1 of Appendix B to 10 CFR 20, or 520 MPC-hours. This corresponds to a whole body dose committment of 100 mrem/week or 1300 mrem/quarter. 10 CFR 20 also provides that appropriate process, engineering, operational controls be applied or respiratory protection equipment be used to maintain exposure to 40 MPC within a period of seven consecutive days.
- 2.2 During emergency conditions, higher uptakes may be authorized in a manner similar to that for increased external exposure (EPP/IP-3.4). In these cases, the allowed internal exposure must be such that the total dose committment-- internal and external exposure combined--does not exceed that specified for external exposure in EPP/IP-3.4. It is infeasible to establish guidelines applicable to all conceivable scenarios, however, three guidelines are provided below. The Radiological Contro! Coordi-



nator will establish exposure limits and assign respiratory protection equipment that are compatible with the safe and timely performance of protective/corrective actions, or life-saving measures.

- 2.2.1 Although all exposures shall be maintained as low as reasonably achievable during a emergency, respirators should not be assigned to emergency workers or ECC personnel if the use of respirators will have an adverse affect on the timely implementation of emergency measures and the projected exposure (for the observed activity and estimated time of exposure) is less than 40 MPC-hours/week.
- 2.2.2 If the projected exposure above exceeds 40 MPC-hours/week, consideration should be given to alternative respiratory protection measures (such as thyroid prophylaxis without a respirator or use of iodine sorbant cannisters), or to authorizing emergency exposures.
- 2.2.3 To the extent practicable, and consistent with prevailing conditions, efforts to restore airborne activity levels to normal levels should be initiated as soon as possible.
- 2.3 Protection factors for respirators are provided in the RCM. However, the RCM provides that these protection factors are not applicable unless the individual has been fit-tested on the wearer. Under emergency conditions, it is appropriate to allow a respirator to be worn, and to perform necessary fit-testing after use.

3. Thyroid Prophylaxis (Potassium Iodide)

3.1. General

The release of substantial quantities of radioiodines is postulated for nearly every accident scenario that involves significant offsite exposures. These radioiodines pose a significant threat to the thyroid gland and will require protective action to minimize the thyroid exposure.



Stable iodine is a useful agent to block the uptake of radioiodine by the thyroid gland. Blocking occurs when the thyroid gland is saturated with stable iodine, thus preventing the uptake of radioactive iodine species. Potassium iodide has been approved by the Food and Drug Administration for this use.

Potassium iodide must be taken prior to exposure to radioiodine to be completely effective. Approximately 30 minutes are required for the onset of blocking following administration. A substantial benefit is obtainable, however, when the potassium iodine is administered within 3 to 4 hours following acute exposure to radioiodine. Limited benefits are obtainable up to 12 hours following exposure. The radioiodine which is not taken up by the thyroid will be eliminated from the body in about 48 hours, however, some recirculation is possible, so potassium iodide should be administered (about 130 mg/day) for 3 to 10 days following acute exposure.

This EPP/IP only applies to employees and contractors of Duquesne Light Company. Duquesne Light personnel shall not supply potassium iodide to members of the general public. Distribution of potassium iodide to members of the general public is a responsibility of the respective departments of health in West Virginia, Ohio, and/or Pennsylvania.

3.2. Criteria for Use

Potassium iodide has been approved as a protective measure for emergency use only. It shall be used at the Beaver Valley Power Station only under the following conditions, and at the direction of the Emergency Director.

3.2.1 In the absence of timely survey data, and if plant instrumentation indicates the possibility that an accident has occurred which has or will cause the release of significant quantities of radio-iodine, the Emergency Director, on the advice of the Radiological Controls Coordinator, may order the distribution of potassium iodide to DLC and contractor emergency personnel assigned to the Beaver Valley Power Station.

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- 3.2.2 When respiratory protection equipment does not provide adequate protection from I-131. For iodine-131, a SCBA (highest protection factor of respirators available) allows entry to areas with airborne radioactivity of 9 E-5 μ Ci/cc (I-131), without exceeding MPC limits. At radioactivity levels greater than 9 E-5 μ Ci/cc (I-131), the use of potassium iodide may be warranted for personnel required to remain in affected areas (monitoring teams, Emergency Squad personnel, security, etc).
- 3.2.3 There is no protection factor associated with the use of J5 potassium iodide. Therefore, respirators and/or stay-time controls should continue to be used to maintain exposure to airborne activity (less noble gases) within designated limits.
- 3.2.4 Potassium iodide will be procured, stored, and administered to DLC and contractor emergency personnel assigned to the Beaver Valley Power Station in accordance with the directives of the Duquesne Light Company Medical Department.
- 3.2.5 Personnel who are to be administered potassium iodide shall be briefed on the use of the material. Attachment 1 contains instructional material on potassium iodide as a thyroid prophylactic.

3.3. Precautions

3.3.1 As administered per step 3.1, potassium iodide is a safe, effective pharmaceutical for relatively healthy individuals. (Even at the much larger therapeutic levels it is considered to have a small risk.) However, potassium iodide should not be used by individuals who know that they are allergic to iodine. If an allergic reaction occurs, medical assistance shall be obtained as soon as possible. Allergic reactions may include skin rashes, fever and joint pains, swelling of parts of the face and body, and/or severe shortness of breath. Potassium iodide should be administrated on a voluntary basis.



3.3.2 Potassium iodide has no effect for particulate radioactivity nor for noble gases. Appropriate protective measures must still be established for these types of airborne radioactivity. However, when practicable, a respirator should be used in conjunction with potassium iodide, unless it has been positively identified that the airborne radioactivity is exclusively radioiodine.

3.4 Post-Exposure Actions

Appropriate whole body counting should be performed on any individual who has been determined to have been exposed to 10 MPC-hours or greater within seven consecutive days while using potassium iodide. The protection factor assigned to any respirator used concurrent with the potassium iodide may be used in assessing the 10 MPC- hour uptake. If whole body counting indicates an uptake in excess of 70 nCi (10% MPBB for I-131), the individual should be restricted from further exposure pending evaluation by Radcon personnel.

4. Use of Iodine Sorbant Cannisters

4.1. General

NUREG-0041 and Regulatory Guide 8.15 do not provide a protection factor for iodine sorbant cannisters for routine use, because of difficulties ensuring continued protection. As a result, the only respirators which are suitable in iodine atmospheres are air supplied devices, such as SCBA and air hose masks. (NUREG-0041 prohibits the use of air hose masks in rescue operations.) However, in addition to airborne radioactivity, the areas in which the respirators are likely to be used may also be affected by high dose rates. Since mobility is reduced when wearing SCBAs, it may be more conducive to overall exposure reduction to use iodine sorbant cannisters in lieu of SCBAs. For these reasons, the Radiological Control Coordinator may direct that iodine sorbant cannisters be used in emergency conditions pursuent to the conditions in Step 4.2.



4.2. Conditions of Use

- 4.2.1 The filter cannisters authorized are the MSA GMR-1 charcoal cannister, or the Scott TEDA-impregnated charcoal cannister, as a allable.
- 4.2.2 The protection factor is 50 for iodine
- 4.2.3 The respirator shall not be used in iodine atmospheres greater than 100 times the Table 1, Column 1, Appendix B to 10 CFR 20 value for the specific iodine nuclide. For iodine-131, this is 9 E-7 µCi/cc. (Assumes stay-time control.)
- 4.2.4 The stay-time in affected areas should not exceed 20 MPChours in any seven consecutive days. (This provides for additional subsequent exposure.)
- 4.2.5 Appropriate representative air sampling shall be performed.
- 4.2.6 Suitable MPC-hour records shall be kept in accordance with applicable Radcon procedures.
- 4.2.7 Personnel exposure to iodine atmospheres with iodine sorbant cannisters shall be monitored as follows:
 - o Routine weekly whole body counting
 - Special whole body counting whenever 10 MPC-hours stay-time is recorded in any seven consecutive days.
 - o If the results of the whole body counting above indicates an iodine uptake in excess of 70 nCi, that individual shall be restricted from further entry to iodine atmospheres pending evaluation by Radcon personnel.



4.2.8 Sorbant cannisters shall not be re-used. However, an individual may re-use the same cannister for multiple entries during a single shift, after which it will be replaced.

E. PROCEDURE

none

F. REFERENCES

- Beaver Valley Power Station Emergency Preparedness Plan and Implementing Procedures
- 2. Title 10, CFR Part 20
- NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials"
- DHEW, FDA, "Potassium Iodide as a Thyoid Blocking Agent in a Radiation Emergency", FR 43-58798, December 15, 1978
- 5. Commonwealth of Pennsylvania Department of Health Radiation Emergency Response Plan, Appendix J, "Patient Information (on the) Use of Saturated Solution of Potassium Iodide (SSKI) for Thyroid Blocking"
- 6. NCRP Report No. 39, "Basic Radiation Protection Criteria"
- Letter H-5 79-739 of May 16, 1979 from Mr. Alan Hack, LASL, Respirator Research and Development Section to Mr. John Collins, USNRC RE: Respiratory protection at TMI (includes discussion on LASL results on iodine sorbants)

G. ATTACHMENTS

1. Instructional Material on Potassium Iodide

EMERGENCY AND EVACUATION PLAN FOR CONSTRUCTION PERSONNEL (UNIT 1)

(Schneider Power Corp. & Subcontractor Personnel)

1.0 PURPOSE AND SCOPE

- 1.1 This plan pascribes the procedure to be followed by all Schneider Power Corp./ Subconcractor personnel in the event of radiological hazard situation classed as UNUSUAL EVENT, ALERT, SITE, and GENERAL Emergencies as herin described for BVPS Unit 1. The purpose of this plan is to account for and provide adequate protection for and instruction to construction personnel until Duquesne Light Company (BVPS-Unit 1) Operating Department(s) can assess the seriousness of the incident and provide a proper course of action.
- 1.2 Implementation of the plan will mitigate the consequences of an emergency or accident and provide reasonable assurence that appropriate measures are being taken to protect the health and safety of the workers. This plan has been designed to coordinate and cooperate with the Beaver Valley Power Station Unit | Emergency Preparedness Plan (BVPS-EPP).
- 1.3 This plan is in recognition of the immediate need to implement emergency measures to protect or provide aid to affected personnel at BVPS-1. Provisions shall be made for an annual review of this plan and updating/revisions be made as deemed necessary based on training, drills and changes within BVPS-1.

2.0 DEFINITIONS

- 2.1 CARD READER a Computerized card-key Security System, used upon implementation of this plan to identify and print out a list of all personnel within selected areas of the station, ensuring personnel accountability.
- 2.2 CONTRACTOR ACCOUNTABILITY BADGE a means of identification, supplied to construction personnel upon hire, used for accountability purposes.
- 2.3 CONTRACTORS ACCOUNTABILITY TRAILER located at the west side of the Trailer City Complex, used by construction personnel to enter/exit the Trailer City Complex.
- 2.4 DLC ALTERNATE ACCESS BUILDING Located at the northeast corner of the BVPS-I security boundry, used by construction personnel to enter/exit
- 2.5 DLC SECURITY/CARD-KEY BADGE a means of identification supplied by the Duquesne Light Company to personnel successfully scree ad and permitted unescorted access within BVPS-I.
- 2.6 EMERGENCY ALARM SIGNAL a 450 Hertz, 4 pulse/second signal, sounded three
 (3) times at five second intervals, seperated by two second pauses repeated
 each minute for five (5) minutes, this signal can be readily distinguished from
 the stand by alarm which is of a slower warbling sound. The Emergency
 Alarm Signal is tested every Friday at 12:00 noon.

- 2.7 PRIMARY ASSEMBLY AREA assigned area/facility in which possonnel are to report for further alert instructions.
- 2.8 RADIOLOGICAL HAZARD SITUATION-CLASSES : Degradation of the level of safety within BVPS-I or SAPS, requiring emergency organization response. Potential escalation might develop into the following classes as dstermined by the Duquesne Light Company-Operating Department(s).
 - 2.8.1 Notification of Unusual Event Off-normal events which do not, by themselves, constitute significant events, but some of which could indicate a potential degradation in the level of safety of the plant which might develop into an ALERT, SITE or GENERAL EMERGENCY.
 - 2.8.2 Alert Emergency Events which indicate an actual degradation in the level of safety of the plant.
 - 2.8.3 Site Emergency Events which involve actual or likely major failures of plant functions needed for protection of the public. Protective actions are likely to include evacuation of plant areas, other than control rooms and emergency stations.
 - 2.8.4 General Emergency Events which involve actual or imminent substantial core degradation or melting with potential for loss of containment intigrity. Pretective actions would be immediate site evacuation.
- 2.9 TRAILER CITY COMPLEX temporary housing facilities located north of BVPS-1, used by construction for offices/change trailers.
- 2.10 VISITOR personnel on site, within the Trailer City Complex and/or BVPS-I on a temporary basis to visit personnel or servicing construction activities.

3.0 CODES AND STANDARDS

This plan shall comply with applicable procedures, codes, guides, or standards of Duquesne Light Company and the U.S. Nuclear Regulatory Commission.

4.0 ATTACHMENTS

- 4.1 List of Primary Assembly Areas and Area Coordinators (Three pages)
- 4.2 AIR SAMPLING INSTRUCTIONS
- 4.3 DOSIMETER INSTRUCTIONS
- 4.4 OFF SITE ASSEMBLY AREAS MAP

5.0 PREREQUISITES

- 5.1 Construction Security personnel will maintain accurate records of construction personnel entering/exiting the Trailer City Complex and EIC Warehouse in accordance to SPC Site Safety Program procedures St-81-09,09A&09B.
- 5.2 Contractors shall provide Contractor Accountability Badges along with assembly areas for their employees.
- 5.3 Contractor personnel shall enter/exit BVPS-1 only through the Trailer City Complex via the Contractors Accountability Trailer, unless as otherwise instructed by 5.5.
- 5.4 Contractor personnel entering/exiting the EIC Warehouse shall report their entrance/exit to Construction Security personnel.
- 5.5 When permitted, construction personnel entering/exiting BVPS-I via the DLC Main Security Building shall report their entrance/exit to the Contractors Accountabiltiy Trailer.
- 5.6 SPC Timekeeping personnel shall maintain a current personnel roster encompassing all personnel accountable under this plan.

6.0 TRAINING

- 6.1 Employees shall be trained to this plan within two (2) weeks from their starting date.
- 6.2 All personnel shall be trained to this plan annually.
- 6.3 Area Coordinators shall be trained in the operation of air sampling equipment supplied within Primary Assembly Areas. Area Coordinators are identified on attachment 4.1.

7.0 EMERGENCY and EVACUATION PLAN

- 7.1 Construction personnel shall enter/exit EVPS-1 only through the Trailer City Complex unless instructed otherwise.
- 7.1.1 Construction personnel shall obtain assigned Contractor Accountability Badge, affix it to the upper portion of the body while enroute through the Contractors Accountability Trailer, entering Trailer City Complex.
- 7.1.2 Construction personnel exiting the Trailer City Complex shall surrender their own Contractors Accountability Badge and specify destination to Construction Security personnel.
- 7.2 Construction personnel entering/exiting the EIC (SAPS) Warehouse shall report to Construction Security personnel.
- 7.3 Fersonnel entering the Trailer City Complex on a temporary basis shall be issued a Visitor Badge.
- 7.4 Construction personnel/visitors entering BVPS-I, through the DLC Alternate Access Building shall obtain assigned DLC Security Card-Key badge, affix it to the upper portion of the body, pass through exisiting monitoring equipment and exit the building.

- 7.5 Construction personnel exiting BVPS-I shall pause briefly at existing monitoring equipment, surrender their own DLC Security Card Key badge to DLC Security personnel and exit the building.
- 7.6 Construction personnel entering/exiting BVPS+1 during periods in which access through the DLC Alternate Access Building is not possible shall report their presence at the Contractors Accountability Trailer and proceed to the DLC Main Security Building. Upon exit each employee shall report to the Contractors Accountability Trailer and specify destination.

8.0 IMPLEMENTATION

- 8.1 Upon actuation of the Emergency Alarm Signal, construction personnel are to stop work activities and listen for instructions amnounced over BVPS-I Plant Page Party System. If instructions are not given, construction personnel shall report to their respective Assembly Area.
- . 8.2 Construction personnel should leave work areas in as safe a condition as possible.
 - 8.2.1 Shut down construction equipment (if possible)
 - 8.2.2 Lower suspended loads (if possible)
 - 8.2.3 Make an effort to sea! openings in clean systems
 - 8.3 Construction personnel exiting Safety Related/Vital Areas shall utilize CARD READERS, ensuring computorized accountability is maintained.
- . 8.4 To facilitate exit during a bonifide emergency, construction personnel may "tailgate". Each employee shall insert DLC Security Card-Key badge into CARD READER prior to exiting area to maintain personnel accountability.
 - 8.5 In the event CARD READERS are inoperable during a bonifide emergency, construction personnel may "THUMB-CUT" by manually releasing the door lock.
 - 8.6 To alleviate congestion within the DLC locker room, construction personnel shall, at Rad Cons discreation, exit the Primary Auxiliary Building via the locker room-north man door or by passing through the hallway at the DLC-PCA Shop.
 - 8.7 Contractor personnel entering Safety Related/Vital Areas via temporary trailers are to exit utilizing the same trailer, choosing the shortest route possible to reach their Assembly Area.

9.0 ACCOUNTABILITY ACTIONS

- 9.1 Upon activation of the Emergency Alarm Signal DLC Security personnel shall commence personnel accountability in accordance to BVPS-1 EPP/IP 3.2.
- 9.2 Construction personnel shall surrender their own DLC Security Card-Key badge to DLC Security personnel while enroute through the DLC Alternate Access Building.
- 9.3 Construction Security personnel shall secure all exits of the Trailer City Complex, permitting personnel returning to Assembly Area from outside areas to pass through.

- 9.3.1 A review of existing badge boards shall be performed to determine accountability status.
- 9.3.2 Contact with the EIC Warehouse shall be performed to determine accountability status.
- 9.3.3 Construction personnel remaining unaccountable shall be recorded and reported to the SPC-EPP Coordinator/ alternate when contacted.
- 9.4 Construction personnel accountability shall be conveyed to be DLC-CDN Senior Construction Specialist/alternate. In the event contact with the above mentioned party is no possible, accountability status may be reported directly to the DLC-BVPS I Security Coordinator via the BVPS-I Plant Page Party System or the PAX Phone System (extension 162).

10.0. EMERGENCY ACTIONS

- 10.1 Upon assemblement within assembly area, construction personnel shall take necessary precautions in an attempt to assure personal health and sifety.
- 10.1.1 Close all doors and windows seal all openings
- 10.1.2 Shut down ventilation systems
- 10.1.3 Refrain from eating, drinking and smoking
- 10.2 Area Coordinators shall commence air-sampling and monitoring of dosimetry in accordance to attachment 4.2 & 4.3 of this plan, recording necessary information.

11.0 ASSESSMENT ACTIONS

- II.I DLC-Power Station personnel will advise construction personnel of radiation levels at various locations as it might affect Primary Assembly Areas.
- II.2 Directions relating to the radiological hazard/emergency situation will be conveyed to construction personnel as necessary.
- 11.3 Instructions in general, will be announced over the BVPS-1 Plant Page Party System. These instruction may be as follows:
- 11.3.1 RETURN TO WORK resume work activities. Expections may be made in areas near the source of the problem.
- 11.3.2 EVACUATE SITE proceed to OFF-SITE Assembly Area, whichever is upwind of BVPS-1.
 - a) BVPS-II LAYDOWN AREA (east of site
 - b) HOOKSTOWN SUBSTATION (west of site)

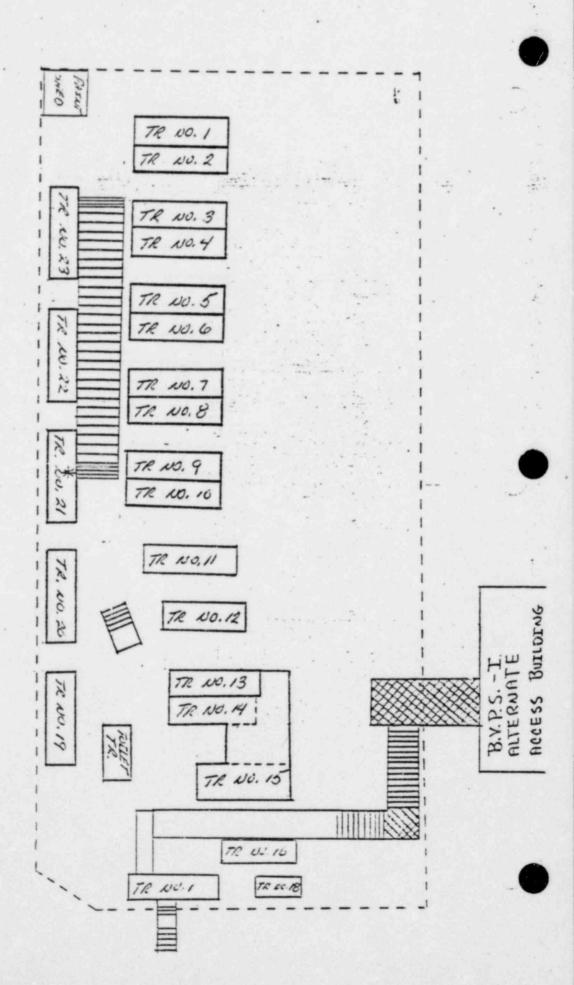
12.0 EVACUATION ACTIONS

- 12.1 DLC Emergency Control Center shall implement procedures for a general site evacuation, Schneider Power Corp./subcontractor personnel will be informed with regard to radiation monitoring teams provided at the main gate visitors gate and vehicle monitoring point.
- 12.1.1 Schneider Power Corp./subcontractor personnel shall be logged out by DLC as they are monitored.
- 12.2 In the event an immediate evacuation is implemented, Area Coordinator shall instruct construction personnel in respect to which OFF-SITE Assembly area to report to. OFF-SITE Assembly Area location maps (attachment 4.4) shall be passed out to construction personnel.
- 12.3 Construction personnel shall retain their assigned Contractors
 Accountability/Visitor Badge, surrendering it upon arrival at
 OFF-SITE Assembly Area. Construction personnel not retaining above
 mentioned badge shall report presence upon arrival at OFF-SITE
 Assembly Area.

ORTH

* - EPPCNGINIT

B.Y. P. S. - I INT NKE STRUCTURE



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PRIMARY ASSEMBLY AREA - AREA COORDINATOR LIST

DAYSHIFT

PRIMARY ASSEMBLY AREA I (TRAILER CITY COMPLEX)

PAUL DEMETO CHUCK LINDSAY BOB THOMAS

PRIMARY ASSEMBLY AREA II (EIC WAREHOUSE - SAPS)

C. BERG ALTERNATE D. McBRIDE

NIGHT SHIFT

PRIMARY ASSEMBLY AREA

PRIMARY ASSEMBLY AREA I

AREA COORDINATOR

PAUL DEMEIO CHUCK LINDSAY BOB THOMAS ALTERNATE JIM SALVATORE

PRIMARY ASSEMBLY AREA !!

C. WINDISCH ALTERNATE R. WHITBECK

AIR SAMPLING INSTRUCTIONS

Purpose

The Air Sampler maintained in the emergency cupboard is to be utilized by the assigned supervisory personnel for sampling for air borne radioactivity in the event of an emergency.

Procedure

- Ensure that the Silver Zeolite Cartridge is properly in place.
 NOTE: If identified as a drill-use the filter or charcoal cartridge
- 2) Turn on sampler and complete the following form.

Date:	Time Started	:	
Area Monitored:			
Reason For Monitoring:		By:	
Air Sampler Flow Rate =		CFM	
35 Cu. Ft	CFM=		Minutes
Operate Sampler for	Minutes (Total)	
Sampler Type	Serial No:		

Sample Calculations:

Step 3: Air Sampler Flow Rate = 5CFM

Step 4: 35Cu. Fit. - 5 CFM = 7 Minutes

Step 5: Operate Sampler for 7 Minutes (Total)

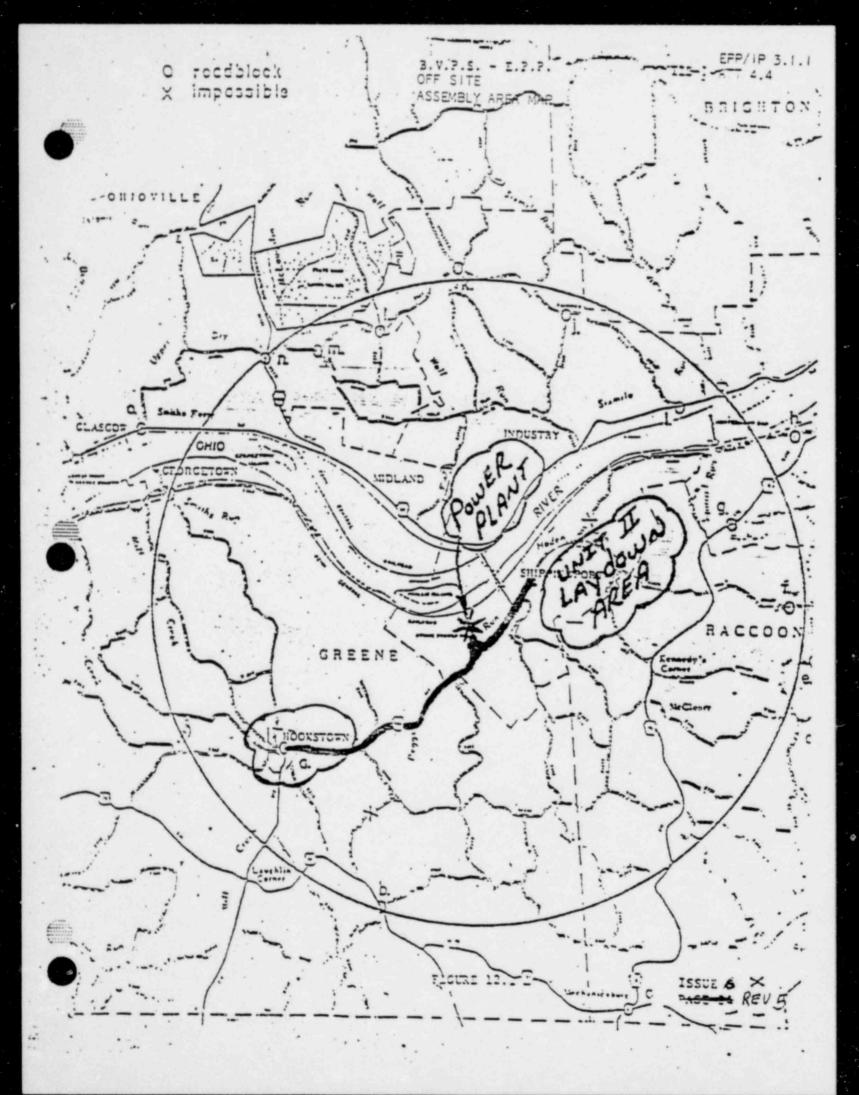
Dosimeter instructions

PURPOSE

The dosimeters maintained in the emergency cabinet will be utilized during the performance of a radiological emergency at the site.

INSTRUCTIONS

- 1. Remove dosimeters from storage and read dosimeters. Note time.
- Wait ten minutes. (Monitor dosimeter readings)
- 3. Read both dosimeters again.
 - a. For dosimeter having a range of 0-500 MP if either reading has advanced one scale increment (20 MR/10 min.-120 MR/hour), this indicates evacuation may be necessary. In such case, contact the DLC-CDN Senior Construction Specialist or Senior CDN Representative and inform them of your finding. The CDN Representative shall contact the BVPS Emergency Control Center (ECC).
 - b. If the I20 MR/hour reading is not exceeded (one scale increment in ten minutes), repeat reading the dosimeter every ten minutes, until instructed by the ECC that the emergency no longer exists or advised by the ECC that continued dosimetry reading is no longer necessary during the emergency or the I20 MR/hour reading is exceeded and the ECC has been notified.



EMERGENCY IMPLEMENTING PROCEDURE

EMERGENCY PERSONNEL MONITORING

A. OBJECTIVE

During an emergency condition, substantial quantities of radionuclides, some of which are not encountered to any significant degree during normal operation, may be released to Station areas and/or the environment. The operation of the BVPS personnel dosimetry program provides reasonable assurance that the exposure of Station personnel during normal operations is accurately determined and recorded. However, under emergency conditions, the use of dosimetry may have to be extended, may have to be supplemented with additional equipment, or may have to be replaced with alternative equipment. This procedure provides general guidance to the TSC staff, and in particular, the Radiological Control Coordinator, for the establishment of personnel monitoring suitable for the radiological conditions observed at the time of the accident.

B. PREREQUISITES/INITIAL CONDITIONS

- An emergency condition has been declared at the Beaver Valley Power Station as provided in the BVPS Emergency Preparedness Plan.
- 2. As a result of the emergency condition, significantly abnormal radiation levels are noted.

C. PRECAUTIONS

During emergencies when there is a great demand for TLD badges, compounded by delays in processing the badges and recording the exposures in the exposure record system (due to large number of devices in use, and/or inaccessibility to TLD processing and data systems, etc.), caution shall be exercised to ensure that the exposure recorded on the badges is credited against the proper individual, and that all exposures are recorded. For this reason, processed and annealed TLD badges should not be re-issued to another individual until it is certain that the association between that particular badge number and the individual to which it was last issued has been appropriately severed, and that the exposure received by the last individual has been properly credited against that individual.



 To facilitate later evaluation of exposures, all dosimetry issue and processing documents should be marked with the date and <u>time</u> the document was completed or processed.

D. GUIDANCE AND CRITERIA

1. General

- 1.1 The Beaver Valley Power Station Radiation Control Manual (RCM) Chapter 1 contains standards for personnel monitoring. Chapter 3, Part 4 of the RCM contains procedures for the issuance, use, collection and processing of dosimetry devices. Chapter 3 Part 12 and Appendix 10 to the RCM discusses documentation of measured personnel exposure. Appendix 7 and Chapter 3, Part 4 of the RCM address requirements for bioassay. The provisions of these documents shall apply to emergency conditions except as specifically provided in this EPP/IP or in the BVPS Emergency Preparedness Plan, or as provided by the Radiological Control Coordinator.
- 1.2 Exceptions or modifications to normal personnel dosimetry practices may be approved by the Radiological Control Coordinator and/or the Emergency Director. Four modifications/exemptions are addressed in this EPP/IP. The first is the extension of dosimetry to areas beyond the designated controlled area. The second is the accelerated collection and processing of dosimetry devices. The third is increased bioassay analyses, and the fourth is assignment of supplementary dosimetry.

2. Assignment of Dosimetry Outside the Designated Controlled Area

2.1 Personnel radiation exposure must be monitored by regulation if 25% of the applicable limit could be received in a quarter by an individual in a restricted area. For radiation workers older than 18 years, this equates to 312 mrem. Chapter 1 of the RCM provides that TLD badges be assigned and issued to all radiation workers and to any other individual who is expected to require access to a controlled area. The TLD badges must be worn by all persons at all times when in a controlled area.



- 2.2 If a significant release of radioactivity occurs and results in radiation levels such that if an individual were to remain in the area, he would receive a dose in excess of 2 mrem in any one hour, or a dose of 100 mrem in any seven consecutive days, the affected area shall be designated as controlled areas and dosimetry shall be worn in the affected area.
- 2.3 As a general rule, personnel remaining onsite following a Site evacuation should wear appropriate TLD badges anywhere on the Beaver Valley Site. In addition, monitoring teams performing offsite or onsite surveys shall retain their dosimetry.
- 2.4 In the event of an emergency involving a Site evacuation, personnel dosimetry issue and collection operations may have to be relocated to a remote location other than the guardhouse, in order to minimize the background reading on the badges. As radiological conditions on the site return to normal, the dosimetry issue operation can be moved back to the guardhouse (or to another designated location) and the areas requiring dosimetry for entry be reduced to those areas where it is warranted by radiation levels, or to within the controlled area.

3. Accelerated Dosimetry Processing

- 3.1 Chapter 1 of the BVPS RCM provides for TLD processing at least once per quarter, and whenever the individual's exposure since the last TLD reading exceeds 800 mrem (by pocket dosimeter, or by dose projection). In addition, the TLD badge will be processed when the results of the previous readings plus two time (2x) the pocket dosimeter reading since the last TLD processing exceed either 2700 mrem per quarter, or 4700 mrem per year.
- 3.2 In addition to the requirements of Step 3.1:
 - 3.2.1 Daily readings of TLDs should be performed during the emergency and, initially, during recovery operations until such time as exposure trends have been identified and normal access and exposure control methods have been re-established. This should be

done for any Site or General emergency that has resulted in the release of radioactivity to the Station, or to the environment.

- 3.2.2 In the event of an accidental exposure, or a planned emergency exposure, the TLDs of the individuals involved shall be processed as soon as practicable following exposure. Further exposure of these individuals, should not be allowed until the results of their TLD badge reading are available and have been evaluated.
- 3.2.3 TLDs left on the badge racks and the associated control badges shall be read as soon as possible following exposure, in order that the personnel exposure prior to the accident may be evaluated to provide a basis for subsequent exposure.

Increased Bioassay Analyses

- 4.1 Chapter 1 and Appendix 7 of the BVPS RCM contains provisions for the bioassay program. Under these provisions, a lung and thyroid count is required for any person whose normal duties may involve routine radiation work (eg: all individuals classified as radiation workers):
 - 4.1.1 Upon assignment to BVPS
 - 4.1.2 At least once per calendar year while assigned to BVPS
 - 4.1.3 Upon termination from BVPS

In addition, any person(s) who by reason or nature of their work have been subjected to ingestion, inhalation or absorption of contamination in the opinion of Radcon supervision should have an immediate whole body count performed.

- 4.2 In addition to the requirements of Step 4.1:
 - 4.2.1 If whole body count results indicate significant fission products such that Sr89 or Sr90 uptake is suspected, urinanalysis shall be performed in addition to whole body counting. A preliminary screening level above which urinanalysis is indicated is 70 nCi



I-131 if the station has been at power within 40 days prior to the accident. Arrangements have been made with offsite vendors for appropriate analyses if this screening level is exceeded. The Radiological Control Coordinator will establish screening levels based on the actual airborne radioactivity mix following the accident if the station has been shutdown longer than 40 days, or to refine the preliminary screening level.

- 4.2.2 If a long-term recovery effort is necessary, periodic comparisions of whole body counting and urinanalyses should be performed on a random sampling of radiation workers to establish the adequacy of the monitoring program. MPC-hours calculations could also be used in this evaluation. Urinanalyses should include gamma scans, Sr89 & Sr90 determinations, tritium determinations, and alpha determinations.
- 4.2.3 Non-routine whole body counts (and urinanalyses, if indicated) should be performed on any individual who is suspected or known to have an exposure to airborne radioactivity:
 - o 10 MPC-hours in a week, including the appropriate protection factor for the respiratory protection, providing that the use of the respirator was in accordance with the respiratory protection program as prescribed in the RCM, and EPP/IP-3.4, "Emergency Respiratory Protection,
 - 40 MPC-hours in a month. Appropriate protection factors may be applied as specified above,
 - o 120 MPC-hours in a calendar quarter. Appropriate protection factors may be applied as specified above, or,
 - O A masal smear indicates masal contamination in excess of 100 dpm.
- 4.2.4 If the result of the bioassay analysis indicates that a given individual has an uptake of a radionuclide, or combinations of radionuclides, that exceeds 5% of the MPBB for that radionuclide, or group of radionuclides, an investigation shall be performed and



documented. Recounts or additional samples/analyses shall be performed to determine the validity of the result. If the result is valid, the following minimum additional actions should be taken:

- Restrict the access of the individual to prevent additional exposure until the extent of the uptake can be determined,
- O Arrange a schedule of additional analyses as necessary to support dose assessment,
- Evaluate, using suitable models and calculational methods, the dose equivalent of the uptake. Document all assumptions and calculations. The dose equivalent shall be added to the individual's NRC Form 5 as appropriate, and,
- o If the suspected uptake exceeded MPBB, the incident shall be reported to the NRC in accordance with Title 10, Code of Federal Regulations, Part 20.405.

5. Supplementary Dosimetry

- 5.1 In the evant of an emergency, some areas within the Station may be affected by substantial quantities of radionuclides that differ in magnitude and/or nature from those typically observed during normal operations. The most significant of these is likely to be beta emitters which will give rise to substantial skin doses. Most TLD badges are capable of measuring typically occuring noble gases, although there may be difficulty with the 80 keV gamma from Xe-133. However, in such fields, the TLD must be worn in a manner which is consistent with the amount of exposed skin. For example, if the eyes and the skin of the face are exposed, the TLD should be worn on the outside of the protective clothing. If the entire body is covered with protective clothing and the individual is wearing a full-face respirator (or hood), the TLD should be worn on the inside of the protective clothing. This is particularly important if several layers of protective clothing (and especially plastic rain-suits) are being worn.
- 5.2 Extremity badges and neutron badges should be worn as indicated in radcon procedures.

5.3 High range self-reading dosimeters should be used for entering areas when the dose commitment is expected to exceed the range of the low range dosimeter in a short period of time.

6. Post Accident Exposure Evaluation

6.1 In those situations in which an individual has been contaminated and some persistent contamination has remained following decontamination; and/or the individual has received significant external or internal exposure in excess of 10 CFR 20 limits as indicated by whole body/bioassay or by personnel dosimetry or by survey data, an evaluation of the individual dose commitment will be performed.

The Radiological Programs Coordinator and the Radiological Operations Coordinator, in conjunction with outside consultation (such as Drs. Wald and Spritzer), shall perform this evaluation using accepted health physics dosimetry practices as outlined in guidance documents such as ICRP-30, ICRP-28, IAEA-152, and the MIRD pamphlets. This evaluation will be documented, reviewed by the OSC, and filled in the individual's exposure record.

E. PROCEDURE

Dosimetry actions and bioassays are performed in accordance with the Beaver Valley Power Station RCM except as noted in Section D of this EPP/IP

F. REFERENCES

- Beaver Valley Power Station Emergency Preparedness Plan and Implementing Procedures
- 2. Title 10, CFR Part 20
- Regulatory Guide 8.9 "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program"
- 4. Beaver Valley Power Station Radiation Control Manual
- NUREG-0654/FEMA-REP-1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"

G. ATTACHMENTS

none