Davis Besse Power Station
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Davis-Besse Nuclear Power Station

EMERGENCY PLAN OFFNORMAL OCCURRENCE PROCEDURE

RA-EP-02870

STATION ISOLATION

Revision 02

Prepared by: Craig Stachler

Procedure Owner: Manager - Security

Effective Date: NOV 13 2002

Procedure Classification:

_____ Safety Related

_____ Quality Related

__X__ Non-Quality Related

LEVEL OF USE:

IN-FIELD REFERENCE

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1.0 PURPOSE

This procedure describes measures to be taken if the Davis-Besse Nuclear Power Station (DBNPS) is or is likely to become isolated.

2.0 REFERENCES

2.1 Developmental

2.1.1 Davis-Besse Nuclear Power Station (DBNPS) Emergency Plan

2.1.2 Emergency Plan Telephone Directory

2.1.3 Human Resources Letter 513: Pay in Adverse Weather/Emergency Situations

2.2 Implementation

2.2.1 NOP-LP-1002, Fitness for Duty Program

2.2.2 RA-EP-00600, Emergency Facilities and Equipment Maintenance Program

3.0 DEFINITIONS

3.1 ADVERSE WEATHER CONDITIONS - Weather conditions which can disrupt normal vehicular transportation to and from DBNPS. These conditions are primarily winter storms and flooding.

3.2 CONTINUOUS STATION ISOLATION PREPARATIONS - Actions taken in advance to minimize discomfort for persons who are stranded at DBNPS. These preparations include storage and maintenance of isolation supplies and the staging of Isolation Supply Trailers.

3.3 ISOLATION WATCH - Adverse weather has formed and is approaching the area.

3.4 ISOLATION WARNING - A formal notice that DBNPS may be isolated from normal vehicular transportation by adverse weather conditions.

3.5 STATION ISOLATION - DBNPS will be considered isolated when normal vehicular transportation to and from the station is no longer possible.

3.6 ISOLATION SUPPLY TRAILER(S) - Three trailers contain basic supplies for 50 people for two days; and one trailer contains supplies for 100 people for two days.

3.7 STAGING - The act of relocating one or more of the Station Isolation Supply Trailers in preparation for use.

3.8 EMERGENCY VEHICLES - Any vehicle which may be utilized during an emergency (salt truck, ski-dozer, etc.).

3.9 DISMISS - As used in this procedure, dismissed personnel are not required for continued station operation. Dismissed personnel may stay at DBNPS or they may leave if they wish.

4.0 RESPONSIBILITIES

4.1 The Supervisor - Emergency Preparedness shall maintain food supplies and sleeping facilities as defined in RA-EP-00600, Emergency Facilities and Equipment Maintenance Program.

4.2 The Shift Manager is responsible for declaring Isolation Watches, Warnings and Station Isolations when weather conditions necessitate these declarations.

4.3 Other positions with responsibilities in this procedure are: The Emergency Plant Manager, the Shift Engineer, the Supervisor - Security Shift, and the Isolation Coordinator.

4.4 Davis-Besse Nuclear Power Station Personnel:

a. should monitor local television and radio stations for weather and road conditions.

b. shall not contact the Control Room for weather and road reports.

c. shall carry their Company identification card whenever performing Company business.

d. are responsible for leaving their work area in a safe condition.

5.0 INITIATING CONDITIONS

This procedure shall be utilized by the Shift Manager during station isolation. Station isolations are typically caused by adverse weather conditions such as snow storms, ice storms, and flooding.

6.0 PROCEDURE

NOTE 6.1

1. An Isolation Watch is used to increase station and On Call Management's awareness of the potential for adverse offsite road conditions, and to prestage equipment and personnel.

2. Refer to Attachment 4, Terms Commonly Used During Adverse Weather Conditions.

6.1 Isolation Watch

6.1.1 The Shift Manager and Emergency Plant Manager, utilizing available information, evaluate projected severe weather conditions which may impact access to station.

Note: Available Information Sources are:

- Distribution Dispatcher (Delaware Service Center)
- System Dispatcher (System Operation Center)
- Periodic weather reports received on Control Room fax machine
- Local weather reports
- Reports from staff
- Other

6.1.2 If the assessment determines that projected weather may impact access, the following should occur:

a. Evaluate consumable resources: fuel oil, compressed gases, gasoline, etc., necessary for continued plant operation and, as appropriate, arrange delivery prior to the storm.

b. Ensure proper staging of an Isolation Supply Trailer as needed for the Protected Area. Primary staging for the Protected Area is the north side of Service Building 6. Consideration should be given to staging the trailer out of the weather if possible (inside Service Building 6 or the Turbine Building Train Bay).

c. Fuel and shelter designated emergency vehicles, e.g., snow plows.

d. Notify the following continuous service personnel: Maintenance, Security, Radiation Protection and Chemistry.

NOTE 6.1.2.e

1. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.
2. As appropriate, establish conference calls between selected personnel.

e. Evaluate plant needs and place on standby those personnel which may be called in. At a minimum, call in the following on-call personnel when an isolation warning is issued:

- Emergency Plant Manager
- Emergency Assistant Plant Manager
- Emergency Offsite Manager

6.2 Isolation Warning

6.2.1 When the Distribution Dispatcher (Delaware Service Center), the System Dispatcher (System Operation Center) or any other credible source indicates that weather conditions will impact or are impacting station access to the point that conditions will result in a Station Isolation the Shift Manager shall:

a. Issue an Isolation Warning with the concurrence of the Emergency Plant Manager.

NOTE 6.2.1.b

1. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.
2. As appropriate, establish conference calls between selected personnel.

b. Call in the Emergency Plant Manager (EPM), Emergency Offsite Manager (EOM), and the Emergency Assistant Plant Manager . The EOM and EPM may elect to call in additional staff.

c. Call in or retain Operations, Security, Radiation Protection, Chemistry and Maintenance personnel.

d. Notify all personnel on the Integrated On Call Report of the Isolation Warning.

e. Notify the Supervisor - Security Shift of the Isolation Warning.

f. Appoint an Isolation Coordinator to assist the Shift Manager by maintaining a current status of activities associated with the isolation. Ordinarily the EOM is appointed Isolation Coordinator upon arrival at the site.

6.2.2 The Supervisor - Security Shift shall:

a. As appropriate, seek information from personnel reporting to the Station as to the road conditions.

b. Establish contacts with local law enforcement agencies to gather information on road conditions.

c. Periodically advise the Shift Manager as to current road conditions.

6.2.3 The Shift Manager or designee shall:

a. Ensure proper staging of an Isolation Supply Trailer as needed for the Protected Area. Primary staging for the Protected Area is the north side of Service Building 6. Consideration should be given to staging the trailer out of the weather if possible (inside Service Building 6 or the Turbine Building Train Bay).

b. Ensure proper staging of two Isolation Supply Trailers as needed for the Owner Controlled Area Primary staging for the Owner Controlled Area is the east parking lot between the Davis-Besse Administration Building and the Davis-Besse Administration Building Annex.

c. Ensure emergency vehicles and snow removal equipment are ready for use, as appropriate.

d. If station warning is due to snow, ensure that Maintenance Services personnel keep station roadways accessible.

6.2.4 The Emergency Plant Manager should:

a. Confer with the On Call Emergency Director to determine the disposition of non-essential personnel. The following issues should be considered:

1. Staffing requirements for continuous station operation.

2. Staffing requirement for the Emergency Response Organization.

b. IF non-essential personnel are to be dismissed,
THEN, Human Resources Letter 513, Pay in Adverse Weather/Emergency Situations, should be reviewed. An appropriate message should then be prepared and communicated to non-essential employees.

NOTE 6.2.5

1. The need and ability to arrange for transportation is dependent upon the duration and severity of the storm, and the need for personnel. In some cases, it may be more appropriate from a personnel safety perspective to wait out the storm.

2. Call-outs of personnel are subject to the requirements of NOP-LP-1002, Fitness for Duty Program.

3. As appropriate, establish conference calls between selected personnel.

4. Utility employees with a valid Company Identification Card are permitted to travel "closed roads" when performing Company business or when returning directly home from work. As always, personnel should exercise good judgment when traveling on weather impacted roads.

6.2.5 The Isolation Coordinator shall:

a. Use Attachment 1, Minimum Supplemental Station Isolation Staffing, and the Emergency Plan Telephone Directory, to assure the minimum staffing is called in.

b. Arrange transportation for required staff members that can not reach the Station. Transportation resources should be considered in the following order:

1. Station resources

- 4 Wheel Drive Vehicles
- Various Trucks
- Ski-dozer

2. First Energy resources

- Materials/Fleet Management Director

c. Contact personnel to advise them of the location of the pickup point. Contacted personnel shall be informed of the impending isolation, and should be told to prepare to remain onsite for several days

d. Arrange for staging of Protected Area and Owner Controlled Area Isolation Supply Trailers.

e. Coordinate eating and sleeping arrangements for all isolated personnel with the On Call Emergency Facilities Services Manager (Owner Controlled Area) and the Shift Engineer (Protected Area), as appropriate.

6.3 Station Isolation

NOTE 6.3.1

Flooding is a local problem which generally affects all access routes, winter weather may only impact employees in a given community.

6.3.1 When vehicle access to the plant is no longer possible, the Shift Manager shall:

a. Declare station isolation based on the current weather conditions and with the concurrence of the Emergency Plant Manager.

b. Make an announcement over the Gaitronics advising all station personnel of the station isolation.

c. Develop a shift schedule utilizing all available personnel based on the estimated duration of the station isolation.

d. Notify the NRC if the isolation is considered to be a reportable condition under 10 CFR 50.72(b)(1)(v). At a minimum this notification should occur if minimum staffing of the Emergency Response Organization has been called for, and the isolation has lasted longer than four hours. The On Call NRC Liaison should be consulted, as appropriate.

e. Evaluate ongoing and planned work activities and, as appropriate, suspend work which has the potential to impact plant operations.

6.3.2 The Isolation Coordinator shall:

a. Establish a center to collect information and station a communicator.

b. Advise the Shift Manager, Emergency Plant Manager and Emergency Assistant Plant Manager of your location and keep them informed as to the isolation status.

c. Contact each office area in the Owner Controlled Area and advise personnel to keep you appraised as to the number of personnel present in the structure.

d. Supervise issue of supplies from Isolation Supply Trailers for the Protected Area and the Owner Controlled Area using Attachment 3, Inventory Sign Out/Sign In Checklist located in each trailer, as appropriate.

e. Coordinate use of the berthing areas in the DBAB.

6.3 3 The Isolation Coordinator should coordinate the recovery effort to establish priorities following the isolation.

a. Shift relief and staff augmentation

b Re-establishment of site access and parking

c. Additional and replacement material, as needed.

6 4 Deactivation

6 4.1 The Shift Manager shall contact the Emergency Plant Manager and obtain concurrence to deactivate Station Isolation.

6.4 2 The Shift Manager, when the isolation is terminated, shall:

a. Notify the Supervisor - Security Shift that the isolation is terminated.

b. Return shiftworkers to their normal hours and rotation.

c Release extra personnel from duty.

d. Advise NRC that Station Isolation has been deactivated.

6.4.3 The Isolation Coordinator shall:

a. Ensure that all equipment is returned to the appropriate Isolation Supply Trailer(s) for the Protected Area

b. Forward all Inventory Sign Out/Sign In sheets to the Supervisor - Emergency Preparedness.

6.4.4 The Supervisor - Security Shift shall:

a Reevaluate Security staffing and return to normal as appropriate.

6 4.5 The Isolation Coordinator shall:

a. Ensure that all equipment is returned to the appropriate Isolation Supply Trailer(s) for the Owner Controlled Area.

b. Forward all Inventory Sign Out/Sign In Checklist sheets to the Supervisor - Emergency Preparedness

6.4.6 The Supervisor - Emergency Preparedness shall:

a. Inventory all Isolation Supply Trailers in accordance with RA-EP-00600, Emergency Facilities and Equipment Maintenance Program.

b. Order/replenish immediately all supplies needed to restock all Isolation Supply Trailers to ensure a continuous state of readiness.

c. Ensure restaging of Isolation Supply Trailers to specified locations.

d. Ensure any soiled linen is laundered and replaced in the appropriate Isolation Supply Trailer(s).

7.0 FINAL CONDITIONS

Normal access to the Station has been restored, extra personnel have been released, normal shift manning restored housekeeping supplies inventoried and stored, and replacement supplies ordered.

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106:

8.1.1 None

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-NA-00106.

8.2.1 None

ATTACHMENT 1: MINIMUM SUPPLEMENTAL STATION ISOLATION STAFFING

Page 1 of 1

Required*	Recommended	
		Control Room
1		Shift Manager
1		Unit Supervisor
2		Reactor Operators
2	5	Equipment Operators
1		Emergency Assistant Plant Manager (as required by Technical Specifications)
5		Fire Brigade Team
1	2	First Aid Team
		Operations Support Center (OSC)
1		OSC Manager
1	2	Chemistry Tester
	1	OSC Briefer
2		Mechanical Maintenance Personnel
2		I&C Technicians
2		Electrical Maintenance Personnel
	1	OSC Materials Manager
1		OSC RP Coordinator
5		RP Testers
	2	Maintenance Services Personnel
		Technical Support Center (TSC)
	1	Emergency Plant Manager
1		TSC Engineer Manager
1		Core/Thermal Hydraulic Engineer
1		I&C System Engineer
1		Electrical Engineer
1		Mechanical Engineer
	4	Operations Engineer
	1	Computer Technician
	1	Emergency RP Manager
	1	Emergency Security Manager
	1	DBAB Access Security Supervisor
		Emergency Control Center/Emergency Operations Facility (ECC/EOF)
1		Emergency Director
1		Emergency Offsite Manager
1		Emergency Planning Advisor
1		Dose Assessment Coordinator
	1	Dose Assessor
	1	RMT Coordinator
	1	RTL Coordinator
3	6	Radiological Monitoring Team Personnel
1		NRC Liaison
1		State/County Communicator
1		Emergency Facilities Manager

* Required in accordance with the DBNPS Emergency Plan Table 5-1

ATTACHMENT 2: EMERGENCY VEHICLE LIST

Vehicle	Storage Location	Location of Keys
Isolation Supply Trailers	Outside Service Building 4	ECC/EOF Dose Assessment Area, Security, and Shift Manager
*RMT Vehicles	Parking Lot between DBAB and DBABA	ECC/EOF Dose Assessment Area
Ski-dozer	Outside Service Building 4	Shift Manager
Maintenance Services Dump Truck	Service Building 6	Maintenance Services Key Box
*4-Wheel Drive Pick-up	Outside the Personnel Processing Facility (PPF)	Maintenance Services Key Box
Station Services Tractors	Service Building 6	Maintenance Services Key Box
Forklift	Service Building 6	Maintenance Services Key Box

*Denotes vehicles which are equipped to tow the Isolation Supply Trailers

NOTES:

1. Fuel is available at Service Building 4. If the pumps are locked, contact Security for the key.
2. Back-up locations for all keys are the Security locksmith or Mobile Central.
3. This list is correct as of November 2002 and changes may occur.

ATTACHMENT 3: INVENTORY SIGN OUT/SIGN IN CHECKLIST

ATTACHMENT 4
TERMS COMMONLY USED DURING ADVERSE WEATHER CONDITIONS

NOTE

Experience has found that these terms are not consistently used by all media and governmental agencies.

1. *Blizzard Warning* - The worst of all winter warnings, with winds speeds of at least 35 MPH. Heavy snow, dangerous wind chills and blowing snow.

2. *Blowing Snow Advisory* - Snow already on the ground being wind blown and intermittently reducing visibility to ¼ mile or less.

3. *Freezing Rain or Drizzle Advisory* - Light amounts of freezing rain or drizzle enough to cause some travel problems. A winter storm warning is issued for severe freezing rain events.

4. *Snow Advisory* - Snow fall in amounts sufficient to cause significant travel problems (usually several inches).

5. *Snow Emergency* - Bans parking on streets identified as snow-routes. A Snow Emergency may be classified as one of the following levels:

   Level 1 Roadways are hazardous with blowing and drifting snow. Roads are also icy. Drive very cautiously.

   Level 2 Roadways are hazardous with blowing and drifting snow. Only those who feel it is necessary to drive should be out on the roadways. Contact your employer to see if you should report to work.

   Level 3 All roadways are closed to non-emergency personnel. No one should be out during these conditions unless it is absolutely necessary to travel. All employees should contact their employer to see if they should report to work. Those traveling on the roadways may subject themselves to arrest.

6. *Storm Warning* - Bad weather is imminent and actions shall be taken immediately to protect life and property.

7. *Storm Watch* - Bad weather has formed and is approaching the area.

8. *Wind Chill Advisory* - Wind chill levels in the dangerous category (-30° or below).

9. *Winter Weather Advisory* - Used for a combination of snow, freezing rain or sleet and cold temperatures which reduce visibility and cause problems for travelers.

COMMITMENTS

Section	Reference	Comments
None	None	None

Davis Besse Power Station
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Davis-Besse Nuclear Power Station

EMERGENCY PLAN IMPLEMENTING PROCEDURE

RA-EP-01900

GENERAL EMERGENCY

REVISION 01

Prepared by: Paul F. Timmerman

Procedure Owner: Manager - Security

Effective Date: NOV 13 20 Dad 2002

Procedure Classification:

__X__ Safety Related

_____ Quality Related

_____ Non-Quality Related

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STEP-BY-STEP

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1.0 PURPOSE

This procedure outlines the course of action and protective measures required to mitigate a General Emergency.

2.0 REFERENCES

2.1 Developmental

2.1.1 Davis-Besse Nuclear Power Station Emergency Plan

2.2 Implementation

2.2.1 RA-EP-01500, Emergency Classification

2.2.2 RA-EP-01600, Unusual Event

2.2.3 RA-EP-01700, Alert

2.2.4 RA-EP-01800, Site Area Emergency

2.2.5 RA-EP-02010, Emergency Management

2.2.6 RA-EP-02110, Emergency Notification

2.2.7 RA-EP-02240, Offsite Dose Assessment

2.2.8 RA-EP-02245, Protective Action Guidelines

2.2.9 RA-EP-02520, Assembly and Accountability

2.2.10 RA-EP-02530, Evacuation

2.2.11 RA-EP-02710, Reentry

2.2.12 RA-EP-02720, Recovery Organization

3.0 DEFINITIONS

3.1 GENERAL EMERGENCY - Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with the potential for loss of containment integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

3.2 TRANSITORY EVENT - An event which is classifiable in accordance with RA-EP-01500, Emergency Classification, but becomes a lower - classification or non-classifiable event before being declared.

4 0 RESPONSIBILITIES

4.1 The Emergency Director shall be responsible for the implementing of this procedure

4.1.1 The Shift Manager shall become the Emergency Director during activation of the Davis-Besse Emergency Plan and shall be responsible for coordinating the actions of the emergency organization until relieved.

4.1 2 The Unit Supervisor may assume the Emergency Director duties only if the Shift Manager is not in the Control Room, or is incapable of performing those duties.

4.1.3 The Shift Engineer (Shift Technical Advisor) may assume the Emergency Director duties only if neither the Shift Manager nor the Unit Supervisor is in the Control Room and capable of performing those duties.

4.1 4 Upon arrival in the Control Room, the Emergency Assistant Plant Manager or Emergency Plant Manager may relieve the Emergency Director.

4.1 5 The Emergency Plant Manager may assume the Emergency Director duties from the Technical Support Center (TSC) if the TSC and Emergency Control Center/Emergency Operations Facility (ECC/EOF) are activated.

4.1 6 The Emergency Director shall remain in the Control Room until the TSC and ECC/EOF have been activated.

5 0 INITIATING CONDITIONS

This procedure shall be utilized whenever a General Emergency has been classified in accordance with RA-EP-01500, Emergency Classification.

NOTE 6.0

The following procedure steps may be performed simultaneously.

6.0 PROCEDURE

DATE: _____

	TIME	INITIALS

The Emergency Director shall direct performance of the following:

CAUTION 6.1

1. If the General Emergency is due to a security event obtain security management concurrence prior to sounding the Station alarm.

6.1 Sound the appropriate Station alarm (fire, access evacuation, and/or initiate emergency procedures) and make the following announcement over the public address system, TWICE. ____ _____

6.1.1 Upgrading:

"ATTENTION ALL PERSONNEL; ATTENTION ALL PERSONNEL: A GENERAL EMERGENCY HAS BEEN DECLARED. NO EATING, DRINKING, OR SMOKING UNTIL FURTHER NOTICE. ALL MEMBERS OF THE ONSITE EMERGENCY ORGANIZATION REPORT TO YOUR DESIGNATED EMERGENCY RESPONSE FACILITIES. ALL NONESSENTIAL PERSONNEL IMMEDIATELY EVACUATE TO THE LINDSEY SERVICE CENTER. THE REASON FOR THE GENERAL EMERGENCY IS _____."

(STATE REASON)
(SEE RA-EP-02520, ASSEMBLY AND ACCOUNTABILITY FOR FURTHER DETAIL.)

DATE: _____

		TIME	INITIALS
	6.1.2 If there is a localized emergency (e.g , fire), then announce its type and location and instruct personnel to stand clear of the area.		
6 2	Notify the Emergency Response Organization (ERO) in accordance with RA-EP-02110, Emergency Notification.	____	_____
6 3	Protective action recommendations shall be made in accordance with RA-EP-02245, Protective Action Guidelines.	____	_____
6 4	Notify Ottawa County, Lucas County and the State of Ohio within 15 minutes of any emergency classification using the Initial Notification Form in accordance with RA-EP-02110, Emergency Notification.	____	_____
6.5	Notify the NRC within 1 hour using the Event Notification Worksheet in accordance with RA-EP-02110, Emergency Notification.	____	_____
6 6	Initiate a general evacuation of the site in accordance with RA-EP-02530, Evacuation.		
	Nonessential personnel evacuated from the station.	____	_____
6 7	Initiate personnel accountability (unless previously accomplished) in accordance with RA-EP-02520, Assembly and Accountability.		
	Accountability completed.	____	_____
6.8	Terminate all radwaste releases.	____	_____
6 9	Increase surveillance of Control Room instrumentation. Indications of core status (e g., incore thermocouple readings, etc) shall receive particular attention	____	_____
6.10	Ensure the following emergency response facilities are activated·		
	6.10.1 The Operations Support Center	____	_____
	6.10.2 The Technical Support Center	____	_____

DATE: _____

		TIME	INITIALS
6.10.3	The Emergency Control Center/Emergency Operations Facility	____	_____
6.10.4	The Joint Public Information Center	____	_____
6.10.5	The Corporate Emergency Response Organization	____	_____
6.11	Continue dose assessment activities in accordance with RA-EP-02240, Offsite Dose Assessment, with increased emphasis on determining the need for protective actions.	____	_____
6.12	Make periodic updates to offsite agencies as conditions change, or hourly at a minimum, using the Periodic Update Form in accordance with RA-EP-02110, Emergency Notification. These updates may be omitted by mutual agreement with the offsite agencies.	____	_____
6.13	When plant conditions change review RA-EP-01500, Emergency Classification, to determine if the event should be reclassified.	____	_____
6.13.1	Once a General Emergency has been declared the event shall NOT be downgraded without reviewing Downgrading Guidelines in RA-EP-01500, Emergency Classification.		
6.13.2	If the event is reclassified then implement the appropriate procedure.		
6.14	When the General Emergency is downgraded make the following notifications in accordance with RA-EP-02110, Emergency Notification:		
6.14.1	Ottawa County, Lucas County, and the State of Ohio using the Initial Notification Form	____	_____

DATE. _____

		TIME	INITIALS
6.14.2	The NRC using the Event Notification Worksheet	____	_____
6.15	If a Transitory General Emergency condition has occurred notify Ottawa County, Lucas County, State of Ohio, and the NRC in accordance with RA-EP-02110, Emergency Notification.	____	_____
6.16	The individual assuming the responsibilities of Emergency Director shall complete Emergency Director Turnover Data Sheet contained in RA-EP-02010, Emergency Management, using information provided by the Control Room log, unit log, and status boards.	____	_____
6 17	If the emergency situation is mitigated and completely declassified, then perform the following:		
6 17 1	Make this announcement over the public address system· "ATTENTION ALL PERSONNEL, ATTENTION ALL PERSONNEL: THE EMERGENCY SITUATION HAS BEEN TERMINATED. I REPEAT, THE EMERGENCY SITUATION HAS BEEN TERMINATED."	____	_____
6.17 2	Notify Ottawa County, Lucas County, and the State of Ohio using the Initial Notification Form in accordance with RA-EP-02110, Emergency Notification.	____	_____
6.17 3	Notify the Nuclear Regulatory Commission using the Event Notification Worksheet in accordance with RA-EP-02110, Emergency Notification.	____	_____
6.17 4	Notify the Emergency Response Organization (ERO) in accordance with RA-EP-02110, Emergency Notification.	____	_____

DATE: _____

		TIME	INITIALS
6.18	Perform any necessary reentry actions in accordance with RA-EP-02710, Reentry.	____	_____
6.19	Perform recovery actions in accordance with RA-EP-02720, Recovery Organization.	____	_____
6.20	Records, other than Safeguards Records, shall be collected and forwarded to the Emergency Preparedness Supervisor who shall submit them to Nuclear Records Management. Safeguards Records shall be collected and forwarded to the Supervisor - Security Shift.	____	_____

Section 6.0 completed by: _____ Date: _____

7.0 FINAL CONDITIONS

7.1 The emergency condition has been downgraded and actions are being taken in accordance with RA-EP-01800, Site Area Emergency, RA-EP-01700, Alert or RA-EP-01600, Unusual Event

OR

7.2 Emergency conditions no longer exist and actions are being taken in accordance with RA-EP-02710, Reentry, and/or RA-EP-02720, Recovery Organization

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106.

8.1.1 None

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-IM-00106:

8.2.1 RA-EP-01900, General Emergency (when steps have been completed)

8.2.2 Emergency Director Turnover Data Sheet

8.2.3 Initial Notification Form

8.2.4 Periodic Update Form

COMMITMENTS

Section	Reference	Comments
6.3, 6.4, 6.12	TERMS O 13532, TERMS O 13969, TERMS O 15211, TERMS O 15212	Addresses 24 hour notification capability
6.5	TERMS O 13600	Addresses assembly, accountability, and evacuation or sheltering
4.1.3	TERMS O 13670	Specifies conditions under which STA may assume Emergency Director duties
6.11	TERMS O 13584, TERMS O 15210	Concerns protective action recommendations
6.10	TERMS O15209	Dose Assessment
6.1	TERMS Q 00785	Sounding Station Alarms
ALL	TERMS Q 03113	Activating the ERO

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EPIB

Number	Title
RA-EP-02010	EMERGENCY MANAGEMENT
RA-EP-02110	EMERGENCY NOTIFICATION
RA-EP-02220	EMERGENCY CONTROL CENTER ACTIVATION AND RESPONSE
RA-EP-02230	DOSE ASSESSMENT CENTER ACTIVATION AND RESPONSE
RA-EP-02240	OFFSITE DOSE ASSESSMENT
RA-EP-02245	PROTECTIVE ACTION GUIDELINES
RA-EP-02250	RADIATION MONITORING TEAM SURVEYS
RA-EP-02260	RADIOLOGICAL CONTROLS IN THE DBAB
RA-EP-02270	FACILITIES SUPPORT
RA-EP-02310	TECHNICAL SUPPORT CENTER ACTIVATION AND RESPONSE
RA-EP-02320	EMERGENCY TECHNICAL ASSESSMENT

Davis-Besse Nuclear Power Station

EMERGENCY PLAN IMPLEMENTING PROCEDURE

RA-EP-02240

(Supersedes HS-EP-02240, R4, C-2)

Offsite Dose Assessment

REVISION 00 – TOTAL REWRITE

Prepared by: Paul F. Timmerman

Procedure Owner: Manager - Security

Effective Date: NOV 20 2002

Procedure Classification:

X Safety Related

_____ Quality Related

_____ Non-Quality Related

LEVEL OF USE:

IN-FIELD REFERENCE

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1.0 PURPOSE

1.1 This procedure is intended to estimate offsite dose rates from noble gases and radioiodides during accidental, uncontrolled airborne releases.

2.0 REFERENCES

2.1 Developmental

2.1.1 NRC Regulatory Guide 1.4, Assumptions Used for Evaluating the Potential Consequences of a Loss of Coolant Accident for Pressurized Water Reactors

2.1.2 NRC Regulatory Guide 1.109, Calculation of Annual Dose to Man From Routine Releases or Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I

2.1.3 NRC Regulatory Guide 1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants

2.1.4 EPA-400-R-92-001, May 1992, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents

2.1.5 Letter; Correction Factor for Noble Gas Measurements Assuming All Activity as Xe^{133}, from Gregory Stoetzel, Battelle Pacific Northwest Laboratories, September 24, 1984

2.1.6 BT-10372, Letter from Bechtel to Toledo Edison concerning Quantification of Radiation Release from Main Steam Line, June 4, 1980

2.1.7 Davis-Besse Nuclear Power Station Emergency Plan

2.2 Implementing

2.2.1 DB-OP-02531, Steam Generator Tube Leak

2.2.2 RA-EP-02230, Dose Assessment Center Activation and Response

2.2.3 RA-EP-02245, Protective Action Guidelines

2.2.4 RA-EP-02320, Emergency Technical Assessment

2.2.5 Davis-Besse Nuclear Power Station Emergency Plan Telephone Directory

3.0 DEFINITIONS

3.1 DADS - The Data Acquisition and Display System (DADS) provides plant parameters, meteorology data, and dose calculations DADS updates MODCOMP data at 30-second intervals and Validyne data at 1 second intervals The meteorological data is provided at 15 minute intervals, and is an average over that time period. DADS stores information from the last 24 hours

3 2 LAKE BREEZE - A meteorological condition that may occur on clear, sunny days. During a lake breeze, a radioactive release can travel inland, rise, reverse course in an overhead return flow, and then return to land in a convoluted path.

3.3 MODCOMP - The station computer which monitors plant instruments and systems

3.4 SAFETY PARAMETER DISPLAY SYSTEM (SPDS) – The SPDS is a group of graphic displays developed to assist with monitoring plant operations

3 5 SECTOR - One of the 16 areas bounded by radii 22½ degrees apart into which the 10 mile EPZ is divided Sectors are designated by the letters A through R, excluding I and O. Sector A lies north of DBNPS, Sector E lies east, Sector J lies south, and Sector N lies west.

3.6 VALIDYNE - A high speed data acquisition system that monitors 100 critical plant parameters.

4.0 RESPONSIBILITIES

4 1 Emergency Director shall:

4.1 1 Direct calculation of the release and dose rates using available, qualified dose assessment personnel including Licensed Reactor Operators and Senior Reactor Operators

4.2 Qualified Dose Assessment Personnel shall·

4 2.1 Perform dose calculations in accordance with Section 6 0 of this procedure

4.2.2 Report the results of dose calculations to the Emergency Director or Dose Assessment Coordinator, as applicable.

5 0 INITIATING CONDITIONS

This procedure shall be implemented at the request of the Emergency Director, or Dose Assessment Coordinator when an accidental airborne release of radioactivity is in progress or imminent.

6.0 PROCEDURE

6.1 Projection of Offsite Dose Rates Using Plant Data

____ 6.1.1 Determine the release pathway of the radioactive release.

____ a. IF the release is from more than one point [e.g., Steam Jet Air Ejector (SJAE) and Atmospheric Vent Valve (AVV)], THEN sum the resulting dose rates for each point to obtain the total dose rate.

____ 6.1.2 Dose Assessment Instructions using In-Plant Radiation Detector Data

____ a. The Safety Parameter Display System (SPDS) Process Book

1. Select the Dose Calculation tab.
2. Double click the "Dose Rate Calculation an PARs" display title.
3. Refer To Attachment 1, Dose Calculations using SPDS.

____ b. The Offsite Dose Assessment Nomogram per Attachment 2, Instructions for Offsite Dose Assessment Nomogram.

____ c. The appropriate hand calculation below:

RELEASE INDICATIONS	ATTACHMENT
RE 4598 (Station Vent)	3
Secondary Side Releases	4
RE 4596 (Dome Monitors)	5
RE 4597 (Containment Atmosphere)	6

____ 6.1.3 Refer To RA-EP-02245, Protective Action Guidelines, to determine protective action recommendations.

6.2 Projection of Offsite Dose Rates Using Field Monitoring Data

____ 6.2.1 Refer To Attachment 7, Dose Projections Based on Field Monitoring Data, when using field data.

____ 6.2.2 Refer To RA-EP-02245, Protective Action Guidelines, to determine protective action recommendations.

6.3 Meteorological Data

6 3.1 Obtain 15 minute average meteorological data from any of the following:

_____ •Access the SPDS Process Book to access the meteorological data.

_____ •Access the DADS nongraphic terminal to call up the meteorological data.

6.3 2 IF the systems in 6.3.1 cannot be accessed,
THEN monitor meteorological data in accordance with Attachment 9, Meteorological Data.

6.3.3 IF a lake breeze is occurring while an airborne radioactive release is in progress or imminent,
THEN the Dose Assessment Coordinator should:

_____ a. Refer To Attachment 9, Meteorological Data, for lake breeze conditions.

_____ b Inform the Ohio EMA of the lake breeze and that the plume may not follow the course indicated by the meteorological tower wind direction

_____ c Inform the Radiation Monitoring Teams (RMTs) that higher-than-projected dose rates may occur in the plume pathway.

6.4 Total Population Dose

NOTE 6.4 1

The Radiation Protection Section will provide a more definitive estimate of the total population dose after more detailed population and radiological data have been obtained.

6.4.1 During Recovery from an emergency event, obtain an estimate of the total population dose using Attachment 8, Estimation of Total Population Dose.

7.0 FINAL CONDITIONS

_____ 7 1 Dose assessment personnel have been relieved of all emergency support duties

_____ 7 2 All equipment and supplies have been returned to their normal storage locations.

_____ 7.3 Records have been collected and forwarded to the Emergency Preparedness Unit which will subsequently forward them to Nuclear Records Management

8.0 RECORDS

8.1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106:

8.1.1 Printouts from the Dose Assessment computer program

8.1.2 Offsite Dose Nomograms

8.1.3 Data Sheet 1: Total Effective Dose Equivalent (TEDE) Rate

8.1.4 Data Sheet 2: Thyroid Dose Rates from Radioiodines

8.1.5 Data Sheet 3: Release Rate from Main Steam Line Monitor Readings

8.1.6 Data Sheet 4: Release Rates from Noble Gases and Radioiodines Using Primary Parameters

8.1.7 Data Sheet 5: Release Rate from Unisolated Once Through Steam Generator (OTSG) Steam Sample

8.1.8 Data Sheet 6: Release Rates from Steam Jet Air Ejector (SJAE) Releases

8.1.9 Data Sheet 7: Estimated Release Rate with Solid OTSG

8.1.10 Attachment 5: Calculations for Containment Releases Using RE 4596A or 4596B

8.1.11 Attachment 6: Release Rate Calculations for Releases from Containment Using RE 4597 AB or RE 4597 BB

8.1.12 Attachment 7: Dose Projections Based on Field Monitoring Data

8.1.13 Attachment 8: Estimation of Total Population Dose

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management, in accordance with NG-NA-00106:

8.2.1 None

ATTACHMENT 1: DOSE CALCULATIONS USING SPDS
Page 1 of 2

NOTE

- Ensure that the correct instrument is selected. The Drop Down boxes allow different instruments to be selected.
- Instrument readings that are applicable to the selected release paths will appear.

Some instrument readings do not have a corresponding computer point. These inputs require manual entry per Section B, using Manual Inputs

A. USING COMPUTER INPUTS

_____ 1. CLICK the Release Path(s) determined in Step 6.1 1

_____ 2. VERIFY instrument readings for the Release Path(s) selected are correct.

a. IF instrument readings are not displayed or appear incorrect,

_____ (1) VERIFY the computer selection box is checked for the instrument.

_____ (2) VERIFY the correct instrument(s) is selected

_____ (3) IF the instrument reading is now correct, GO TO step A.3

_____ (4) IF the instrument reading(s) requires manual input, GO TO step B.2.

_____ 3. ENTER the hours since reactor trip (0-24) AND PRESS the Enter Key

_____ 4 ENTER the release start (HH MM) AND PRESS the Enter Key

_____ 5 ENTER the projected release duration (in hours, default is 2 hours) AND PRESS the Enter Key.

_____ 6. IF a General Emergency has been declared, THEN click GENERAL EMERGENCY DECLARED

_____ 7. REVIEW the Dose, Dose Rates and Protective Action.

_____ 8 REFER TO RA-EP-02245, Protective Action Guidelines, to determine protective action recommendations

_____ 9. GO TO step A.3 to repeat dose assessment and protective action calculations, if required.

ATTACHMENT 1: DOSE CALCULATIONS USING SPDS
Page 2 of 2

NOTE

- Ensure that the correct instrument is selected. The Drop Down boxes allow different instruments to be selected.
- Instrument readings that are applicable to the selected release paths will appear.

Some instrument readings do not have a corresponding computer point. These inputs require manual entry per Section B using Manual Inputs.

B. USING MANUAL INPUT

_____ 1. CLICK the Release Path(s).

_____ 2. CLICK the computer selection box for the radiation instrument(s) AND VERIFY that the computer selection box is empty.

_____ a. To calculate an Iodine value when the Station Vent Radiation Monitors (RE4598 AB or RE4598 BB) are in the accident range, perform the following calculation:

Iodine = (NG) x (R)

Where: NG = RE4598 AB or RE 4598 BB Channel 1 or 2 Noble Gas value
R = RE4598 I:NG ratio value

_____ 3. CLICK the computer selection box for the met tower instruments AND VERIFY that the computer selection box is empty.

_____ 4. ENTER the selected instrument reading(s) in the instrument box(s).

_____ 5. ENTER the hours since reactor trip (0-24) AND PRESS the Enter Key.

_____ 6. ENTER the release start (HH:MM) AND PRESS the Enter Key.

_____ 7. ENTER the projected release duration (in hrs.; default is 2 hours) AND PRESS the Enter Key.

_____ 8. IF a General Emergency has been declared, THEN click GENERAL EMERGENCY DECLARED.

_____ 9. REVIEW the Dose, Dose Rates and Protective Actions

_____ 10. REFER to RA-EP-02245, Protective Action Guidelines, to determine protective action recommendations.

_____ 11. GO TO step B.3 to repeat dose assessment and protective action calculations, if required.

ATTACHMENT 2 INSTRUCTIONS FOR OFFSITE DOSE ASSESSMENT NOMOGRAM
Page 1 of 2

_____ 1. Obtain a Nomogram (Figure 1)

_____ 2. Record Name, Date, and Time on the Nomogram

3. Determine monitor reading:

_____ 3.1 IF the release is from the Station Vent,
THEN plot the appropriate RE 4598 noble gas reading in μCi/cc on Scale B (AA/BA Channel 1 - Normal Range, AB/BB Channel 1 - Mid-Range, or AB/BB Channel 2 - High Range)

_____ 3.2 IF the release is from the Main Steam Safety Valve (MSSV), Atmospheric Vent Valve (AVV), or AUXILIARY FEEDWATER PUMP TURBINE (AFPT),
THEN plot the cpm reading of RE 600 or RE 609 in the Gross Mode on Scale B.

4 Determine Total Effective Dose Equivalent (TEDE) rates.

NOTE 4 1

Flowrate given on nomogram are conservative values for each release pathway

_____ 4 1 Plot the flow rate on Scale (A)

_____ 4 2 Draw a line from the monitor reading on Scale (B) to the flow rate on Scale (A) This line intersects Scale (C) at the release rate.

_____ 4 3 Determine lower delta T or stability class, and windspeed.

Resources available for determining lower delta T, stability class and windspeed are:
- SPDS
- Plant Process Computer
- RTVAX

_____ 4 4 Plot lower delta T or stability class on Scale (1)

_____ 4 5 Plot windspeed on Scale (2).

_____ 4.6 Draw a line from the lower delta T or stability class on Scale (1) to the wind speed on Scale (2). This line intersects Scale (3) at the χ/Q value.

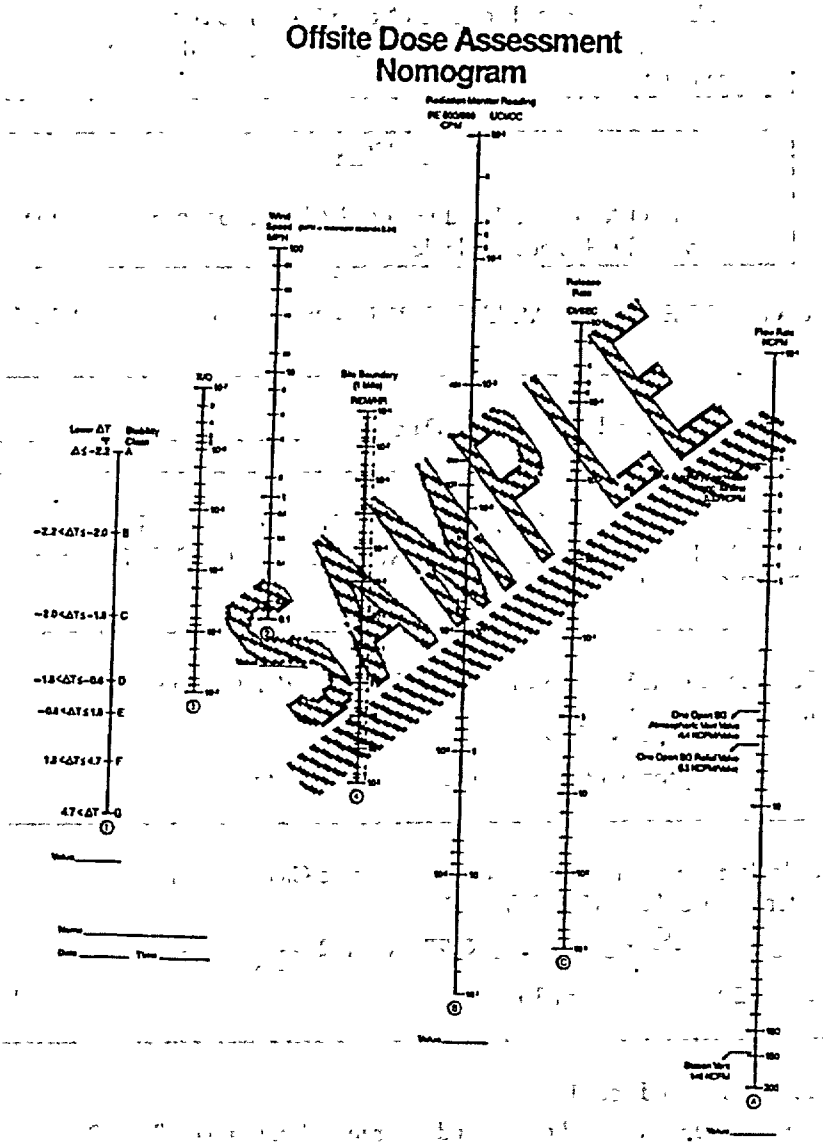
_____ 4.7 Draw a line from the release rate on Scale (C) to the χ/Q value on Scale (3) This line intersects Scale (4) at the TEDE rate for the Site Boundary (0 75 miles).

_____ 4 8 Determine TEDE rates at 2, 5, and 10 miles by dividing the Site Boundary TEDE rate by 5, 15, or 40.

_____ 4.9 IF the 0.75 mile dose for the release is ≥ 1 rem TEDE or ≥ 5 rem thyroid, REFER TO RA-EP-02245, Protective Action Guidelines, to determine protective action recommendations

ATTACHMENT 2: INSTRUCTIONS FOR OFFSITE DOSE ASSESSMENT NOMOGRAM

Figure 1. Offsite Dose Assessment Nomogram



ATTACHMENT 3: STATION VENT RELEASE CALCULATIONS
Page 1 of 6

NOTE

The following Total Effective Dose Equivalent (TEDE) calculation is based solely on Noble Gas The contribution from radioiodides and particulates have been neglected to expedite calculations

CAUTION

Use DATA SHEET 1 and DATA SHEET 2 for dose calculation only if SPDS is not available.

DATA SHEET 1 TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) RATE

1. Record the date and time Date _____ Time_____

2 Record the appropriate Noble Gas activity from RE 4598 in Step 4 (AA/BA Channel 1 - Normal Range, AB/BB Channel 1 - Mid Range, or AB/BB Channel 2 - High Range)

3. Record the Unit Vent flow rate from Computer Point F885 (or F883) in Step 4
   a. IF flow rate is NOT available,
   THEN use 146 KCFM
   AND contact the TSC to verify the flow rate

4. Calculate the estimated release rate for Noble Gas by multiplying the values below and entering in Column (E) of Table 2.

_____ $\frac{\mu Ci}{cc}$ x _____ KCFM x 0 472 $\frac{cc\ Ci}{sec\ KCFM\ \mu Ci}$ = _____ $\frac{Ci}{sec}$

(From 2.) (From 3) (Release Rate)

5 Record the wind speed

Convert the wind speed to $\frac{m}{sec}$ and enter in Column (C) of Table 2

_____ mph x 0 447 $\frac{m/sec}{mph}$ = _____ $\frac{m}{sec}$

(Wind Speed) (Wind Speed)

ATTACHMENT 3: STATION VENT RELEASE CALCULATIONS
Page 2 of 6

DATA SHEET 1 (Cont.)

Table 1. $\frac{\chi u}{Q}$ (m^{-2}) for Stability Classes as a Function of Downwind Distances

	STABILITY CLASS						
MILES	A	B	C	D	E	F	G
0.75	2.1E-6	1.4E-5	3.5E-5	9.9E-5	2.0E-4	4.5E-4	1.3E-3
2	1.1E-7	2.0E-6	5.8E-6	2.2E-5	4.6E-5	1.0E-4	2.8E-4
5	7.1E-9	3.2E-7	1.1E-6	5.5E-6	1.3E-5	3.1E-5	8.2E-5
10	8.9E-10	8.0E-8	3.2E-7	2.0E-6	5.1E-6	1.3E-5	3.4E-5

6. Record Stability Class. (circle one) A B C D E F G (From Attachment 9)

7. Using Table 1 of this attachment, enter $\frac{\chi u}{Q}$ (m^{-2}) at distances of 0.75, 2, 5, and 10 miles for the Stability Class circled above in Column (B) of Table 2.

8. In Table 2, divide Column (B) by Column (C), and enter result in Column (D).

9. In Table 2, multiply Column (D) by Column (E) and enter result in Column (F).

10. Determine the appropriate Noble Gas Correction Factor from Table 3 and enter result in Column (G) of Table 2.

11. Multiply Column (F) by Column (G) and enter in Column (H) of Table 2.

Table 2. Total Effective Dose Equivalent (TEDE) Rate

Column (A)	Column (B)	Column (C)	Column (D)	Column (E)	Column (F)	Column (G)	Column (H)
Downwind Distance (Miles)	$\frac{\chi\mu}{Q}$ (m^{-2})	Windspeed $\left(\frac{m}{sec}\right)$	$\frac{\chi}{Q}$ $\left(\frac{sec}{m^3}\right)$	Release Rate $\left(\frac{Ci}{sec}\right)$	Noble Gas conc. $\left(\frac{\mu Ci}{cc}\right)$	Noble Gas Correction Factor	TEDE Rate $\left(\frac{Rem}{hr}\right)$
N/A	From Table 1	From Step 5	B / C = D	From Step 4	D x E = F	From Table 3	F x G = H
0.75							
2.00							
5.00							
10.00							

ATTACHMENT 3· STATION VENT RELEASE CALCULATIONS
Page 3 of 6

DATA SHEET 1 (Cont.)

Table 3 Noble Gas Correction Factor (NGCF)
(Round time to the nearest value)

1 IF fuel damage or cladding failures have occurred,
THEN use the following Table to obtain the Noble Gas Correction Factor (NGCF).
OTHERWISE, use 10 0 for the Noble Gas Correction Factor (NGCF).

Hours After Reactor Shutdown	NGCF With Fuel Damage	Hours After Reactor Shutdown	NGCF With Fuel Damage
0	1540	31	22 8
0 5	892	32	22 6
1	673	33	22 4
1.5	565	34	22 2
2	491	35	22 0
2.5	432	36	21 9
3	381	37	21 8
3 5	338	38	21 6
4	301	39	21 5
4 5	268	40	21 4
5	240	41	21 4
6	193	42	21.3
7	158	43	21.2
8	130	44	21.1
9	108	45	21.1
10	90.6	46	21.0
11	77.0	47	21.0
12	66.3	48	20.9
13	57 8	49	20.9
14	51 0	50	20.8
15	45 5	51	20.8
16	41 2	52	20.8
17	37 7	53	20.7
18	34 8	54	20.7
19	32 5	55	20.7
20	30 7	56 - 60	20 6
21	29 1	61 - 65	20.5
22	27 9	66 - 75	20 4
23	26 9	76 - 96	20.3
24	26.0	≥97	20.2
25	25.3		
26	24.7		
27	24.2		
28	23.8		
29	23 4		
30	23 1		

ATTACHMENT 3: STATION VENT RELEASE CALCULATIONS
Page 4 of 6

NOTE

The following Thyroid calculation is based on the inhalation pathway for radioiodides. The external dose from radioiodide is neglected to expedite calculations.

DATA SHEET 2: THYROID DOSE RATES FROM RADIOIODIDES

1. Record the date and time Date _____ Time _____

2. Record the value of I-131 activity from Channel 3 of RE 4598 AA/BA in Step 4.
   a. Noble gases can make the I-131 reading falsely high. Request that Radiation Protection personnel verify the I-131 reading.
   b. IF the release continues,
      THEN insert a silver zeolite cartridges into RE 4598 AA or RE 4598 BA.
   c. IF the RE 4598 AA/BA Iodine-131 reading exceeds $3.0E^{-2}$ μCi/cc,
      THEN request that RP personnel provide the I-131 concentration.

3. Record the Unit Vent flow rate from Computer Point F885 (or F883) in Step 4.
   a. IF flow rate is NOT available,
      THEN use 146 KCFM
      AND contact the TSC to verify the flow rate.

4. Calculate the estimated release rate of I-131 by multiplying the values below and enter in Column (E) of Table 5.

$$\underset{\text{(From 2.)}}{\_\_\_\_\_}\ \frac{\mu Ci}{cc} \times \underset{\text{(From 3.)}}{\_\_\_\_\_}\ KCFM \times 0.472\ \frac{cc\ Ci}{sec \cdot KCFM\ \mu Ci} = \underset{\text{(Release Rate)}}{\_\_\_\_\_}\ \frac{Ci}{sec}$$

5. Record the wind speed.
   Convert the wind speed to $\frac{m}{sec}$ and enter in Column (C) of Table 5.

$$\underset{\text{(Wind Speed)}}{\_\_\_\_\_}\ mph \times 0.447\ \frac{m/sec}{mph} = \underset{\text{(Wind Speed)}}{\_\_\_\_\_}\ \frac{m}{sec}$$

ATTACHMENT 3: STATION VENT RELEASE CALCULATIONS
Page 5 of 6

DATA SHEET 2 (Cont.)

Table 4. $\frac{\chi\mu}{Q}$ (m^{-2}) for Stability Classes as a Function of Downwind Distances

	STABILITY CLASS						
MILES	A	B	C	D	E	F	G
0 75	2 1E-6	1.4E-5	3 5E-5	9.9E-5	2.0E-4	4 5E-4	1.3E-3
2	1 1E-7	2.0E-6	5 8E-6	2 2E-5	4 6E-5	1 0E-4	2.8E-4
5	7 1E-9	3.2E-7	1 1E-6	5 5E-6	1.3E-5	3 1E-5	8.2E-5
10	8.9E-10	8 0E-8	3 2E-7	2 0E-6	5 1E-6	1.3E-5	3 4E-5

6 Record Stability Class (circle one) A B C D E F G (From Attachment 9).

7. Using Table 4 of this attachment, enter $\frac{\chi\mu}{Q}$ (m^{-2}) for the Stability Class in step 6, at distances of 0.75, 2, 5, and 10 miles in Column (B) of Table 5.

8. In Table 5, divide Column (B) by Column (C), and enter in Column (D).

9 In Table 5, multiply Column (D) by Column (E) and enter in Column (F)

10 Determine the appropriate Radioiodide Correction Factor from Table 6 and enter in Column (G) of Table 5 Multiply Column (F) by Column (G) and enter in Column (H) of Table 5.

Table 5 Thyroid Dose Rate

Column (A)	Column (B)	Column (C)	Column (D)	Column (E)	Column (F)	Column (G)	Column (H)
Downwind Distance (Miles)	$\frac{\chi\mu}{Q}$ (m^{-2})	Windspeed $\left(\frac{m}{sec}\right)$	$\frac{\chi}{Q}$ $\left(\frac{sec}{m^3}\right)$	Release Rate $\left(\frac{Ci}{sec}\right)$	Radioiodide conc. $\left(\frac{\mu Ci}{cc}\right)$	Radioiodide Correction Factor	Thyroid Dose Rate $\left(\frac{Rem}{hr}\right)$
N/A	From Table 4	From Step 5	B / C = D	From Step 4	D x E = F	From Table 6	F x G = H
0.75							
2 00							
5 00							
10 00							

ATTACHMENT 3: STATION VENT RELEASE CALCULATIONS
Page 6 of 6

Table 6. Radioiodine Correction Factor
(Round time to the nearest value)

Hours After Reactor Shutdown	Correction Factor	Hours After Reactor Shutdown	Correction Factor	Hours After Reactor Shutdown	Correction Factor
0	2.88 E+06	26	2.25 E+06	65 - 67	1.97 E+06
0.5	2.86 E+06	27	2.24 E+06		
1	2.83 E+06	28	2.23 E+06	68 - 70	1.96 E+06
1.5	2.81 E+06	29	2.22 E+06		
2	2.79 E+06	30	2.21 E+06	71 - 73	1.95 E+06
2.5	2.77 E+06				
		31	2.19 E+06	74 - 77	1.94 E+06
3	2.75 E+06	32	2.18 E+06		
3.5	2.73 E+06	33	2.17 E+06	78 - 81	1.93 E+06
4	2.71 E+06	34	2.16 E+06		
4.5	2.70 E+06	35	2.15 E+06	82 - 86	1.92 E+06
5	2.68 E+06				
		36	2.14 E+06	87 - 92	1.91 E+06
5.5	2.67 E+06	37	2.14 E+06		
6	2.65 E+06	38	2.13 E+06	93 - 98	1.90 E+06
6.5	2.64 E+06	39	2.12 E+06		
7	2.62 E+06	40	2.11 E+06	99 - 107	1.89 E+06
7.5	2.61 E+06				
		41	2.10 E+06	108 - 118	1.88 E+06
8	2.59 E+06	42	2.10 E+06		
8.5	2.58 E+06	43	2.09 E+06	119 - 135	1.87 E+06
9	2.57 E+06	44	2.08 E+06		
9.5	2.55 E+06	45	2.07 E+06	136 - 173	1.86 E+06
10	2.54 E+06				
		46 - 47	2.06 E+06	≥174	1.85 E+06
11	2.52 E+06				
12	2.49 E+06	48 - 49	2.05 E+06		
13	2.47 E+06				
14	2.45 E+06	50 - 51	2.04 E+06		
15	2.43 E+06				
		52 - 53	2.03 E+06		
16	2.41 E+06				
17	2.39 E+06	54 - 55	2.02 E+06		
18	2.37 E+06				
19	2.36 E+06	56 - 57	2.01 E+06		
20	2.34 E+06				
		58 - 59	2.00 E+06		
21	2.32 E+06				
22	2.31 E+06	60 - 61	1.99 E+06		
23	2.29 E+06				
24	2.28 E+06	62 - 64	1.98 E+06		
25	2.27 E+06				

ATTACHMENT 4 SECONDARY SIDE RELEASE CALCULATIONS
Page 1 of 9

1. IF the release is from more than one point (for example AFPT and SJAE),
   THEN add the dose rates from each point to obtain the total dose rate.

2 For Main Steam Safety Valve (MSSV), Atmospheric Vent Valve (AVV), and Auxiliary Feedwater Pump Turbine (AFPT) releases, determine which parameters are available as calculation inputs

   a IF primary system parameters are available
   THEN REFER TO DATA SHEET 4.

   b IF main steam line monitors (RE 600/RE 609) are available,
   THEN REFER TO DATA SHEET 3.

   c IF the Once Through Steam Generator (OTSG) is solid,
   THEN REFER TO DATA SHEET 7

   d. IF an OTSG steam sample is available,
   THEN REFER TO DATA SHEET 5.

3. IF a Steam Jet Air Ejector (SJAE) release occurs
   AND the Station Vent monitors are functioning,
   THEN perform Station Vent calculations using DATA SHEET 1 and DATA SHEET 2 of Attachment 3.

4. IF a SJAE release occurs,
   AND the Station Vent monitors are NOT functioning,
   THEN REFER TO DATA SHEET 6

ATTACHMENT 4: SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 3
Release Rate from Main Steam Line Monitor Readings

NOTE

The release rates estimated using this method are gross approximations. More accurate release rates may be determined by using RCS activity and estimated primary to secondary leak rates.

NOTE

RE 609 (Computer Point R787) is for OTSG No. 1, and
RE 600 (Computer Point R788) is for OTSG No. 2

1. Record the date and time Date _____ Time _____

2. Record average steam flow rate in lbm/hr.
   a. Consult TSC Engineers.
   b. IF a Main Steam Safety Valve (MSSV) or Atmospheric Vent Valve (AVV) release is occurring,
      THEN use Table 1. of this attachment.
   c. IF an Auxiliary Feedwater Pump Turbine (AFPT) release is occurring,
      AND duration of release is less than one hour,
      THEN use 4.4 E4 lbm/hr
      OTHERWISE Contact TSC Engineers for release rates from AFPT lasting longer than one hour.
   d. Record in Step 6.

3. Verify that the Analyze/Gross Mode Switch of RE 600 or RE 609 is in the GROSS MODE position.

4. Calculate net reading of RE 600 or RE 609 (circle one)

   _____ - 300 cpm = _____ cpm
   RE 600 or RE 609
   (circle one)

5. Calculate radionuclide concentration in the steam by multiplying the net RE 600 or RE 609 reading by the value obtained from Figure 1 of this attachment.

   _____ cpm x _____ = _____ $\frac{\mu Ci}{cc}$
   (From 4.) (Figure 1 value)

6. Calculate Release Rate by multiplying the steam flow with the activity concentration then by the given correction factor.

   _____ $\frac{lbm}{hr}$ x _____ $\frac{\mu Ci}{cc}$ x 3.5 E-6 = _____ $\frac{Ci}{sec}$
   (From 2.) (From 5.) (Release Rate)

ATTACHMENT 4 SECONDARY SIDE RELEASE CALCULATIONS
Page 3 of 9

DATA SHEET 3 (Cont.)

Release Rate From Main Stream Line Monitor Readings

7. Perform one of the following.

   a Insert the Release Rate into Step 4 of DATA SHEET 1 of Attachment 3 and complete DATA SHEET 1.

   b. Plot the noble gas release rate on scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2, Instructions for Offsite Dose Assessment Nomogram.

Table 1 Average Main Steam Safety Valve (MSSV) Flow Rate vs. Time After Reactor Trip

Minutes after Reactor Trip	Average Steam Flow Rate ($\frac{lbm}{hr}$)
1	9 00 E5
2	7 00 E5
3	5.97 E5
4	5.37 E5
5	4.97 E5
6	4.70 E5
8	4 30 E5
10	4 00 E5
15	3 59 E5
20	3 34 E5
25	3.15 E5
30	3.00 E5
35	2.89 E5
40	2.78 E5
50	2.59 E5
$\geq$60	2 42 E5

ATTACHMENT 4: SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 4

Release Rates from Noble Gases and Radioiodides Using Primary Parameters

NOTE

- DATA SHEET 4 assumes all activity leaking from the Primary is released to atmosphere. This assumption is accurate if steam is being released directly from the OTSG via an open Main Steam Safety Valve (MSSV), an open Atmospheric Vent Valve (AVV), an unisolable steam leak to the atmosphere, or if the affected Once Through Steam Generator (OTSG) is being used to supply Auxiliary Feed Pump Turbines. In other cases, the calculation is conservative.
- Place emphasis on the latest leak rate as it will vary throughout the transient. The latest leak rate can be obtained by monitoring safety injection flow rate (i.e., HPI and Makeup).

1. Record the date and time. Date _____ Time _____

2. Obtain the primary to secondary leak rate in gpm from the TSC engineers or ECC Operations Advisor and record in Step 4.

3. Obtain the latest Reactor Coolant I-131and Xe-133 concentration ($\frac{\mu Ci}{cc}$).
   a. IF fuel damage is NOT indicated,
   AND activity concentrations are NOT known,
   THEN obtain pre-trip values from the Emergency RP Manager, and multiply the I-131 value by 10 (to account for Iodine spiking).
   b. IF fuel damage is indicated,
   AND activity concentrations are NOT known,
   THEN obtain estimates from TSC Operations Engineers.
   c. Record in Step 4.

4. Calculate the Release Rate.

   Radioiodine: _____ gpm x _____ $\frac{\mu Ci}{cc}$ x 6.3E-5 = _____ $\frac{Ci}{sec}$
   (From 2) (I-131) (Release Rate)

   Noble Gas: _____ gpm x _____ $\frac{\mu Ci}{cc}$ x 6.3E-5 = _____ $\frac{Ci}{sec}$
   (From 2) (Xe-133) (Release Rate)

5. Perform one of the following:
   a. Insert the Noble Gas Release Rate into Step 4 of DATA SHEET 1 of Attachment 3 and complete DATA SHEET 1.
   b. Insert the I-133 Release Rate into Step 4 of DATA SHEET 2 of Attachment 3 and complete DATA SHEET 2.
   c. Plot the Noble Gas Release Rate on scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2.

ATTACHMENT 4: SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 5

Release Rate from Unisolated OTSG Steam Sample

1.	Record the date and time	Date _____ Time _____
2	Determine the total steam flow in lbm/hr, from the following a Consult TSC Engineers b. IF a MSSV or AVV release is occurring, THEN use Table 1 of this attachment c. IF an AFPT release is occurring, AND release duration is less than one hour, THEN use 4 4E4 lbm/hr, OTHERWISE Contact TSC Engineers for release rates from AFPT lasting longer than one hour d. Record in Step 4.	
3	Obtain the Xe-133 or I-131 concentration $\left(\frac{\mu Ci}{gm}\right)$ of the OTSG steam sample from the Emergency RP Manager Record in Step 4 (Sample $\left(\frac{\mu Ci}{cc}\right)$ may be converted directly to $\left(\frac{\mu Ci}{gm}\right)$ provided the sample was analyzed at room temperature.)	
4	Calculate the Release Rate by multiplying the steam flow by the concentration then by the correction factor (based on water density). _____ $\frac{lbm}{hr}$ x _____ $\frac{\mu Ci}{gm}$ x 1.27E-7 = _____ $\frac{Ci}{sec}$ (From 2) (From 3) (Release Rate)	
5	Perform one of the following a. Insert the Noble Gas Release Rate into Step 4 of DATA SHEET 1 of Attachment 3 and complete DATA SHEET 1 b Insert the I-131 Release Rate into Step 4 of DATA SHEET 2 of Attachment 3 and complete DATA SHEET 2. c. Plot The Noble Gas Release Rate on scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2.	

ATTACHMENT 4: SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 6

Release Rate from Steam Jet Air Ejector (SJAE) Releases

NOTE

SJAE Releases pass through the Station Vent, and will contribute to the Station Vent Monitor Readings.

1. Record the date and time Date _____ Time _____

2. Record the SJAE Noble Gas activity in cpm from RE 1003A or RE 1003B in Step 5.

3. Record the SJAE flow rate in cfm from FI 1002 in Step 5.

4. Choose the appropriate correction factor and record in Step 5.
   - For RE 1003A, use 1.3 E-11
   - For RE 1003B, use 1.5 E-11

5. Calculate the Release Rate of Noble gases by multiplying the values below:

_____ cpm x	_____ cfm x	_____ =	_____ $\frac{Ci}{sec}$
(From 2.)	(From 3.)	(From 4.)	(Release Rate)

6. Perform one of the following:

   a. Insert the Release Rate into Step 4 of DATA SHEET 1 of Attachment 3 and complete DATA SHEET 1.

   b. Plot The Noble Gas Release Rate on scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2.

ATTACHMENT 4 SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 7

Estimated Release Rate with Solid Once Through Steam Generator (OTSG)

NOTE

Complete this data sheet for every incident in which the relief valves open The number of MSSVs open and length of time that they are open may only be obtainable by direct observation

1. Record the date and time Date _____ Time _____

2 Calculate the net reading of RE 600 or RE 609 (circle one)

_____ cpm - 300 cpm = _____ cpm
(Gross Reading) (Background) (Net Reading)

3 Use time after reactor shutdown to determine the Reactor Coolant activity conversion factor from Figure 1.

Record in Step 5 & 7 _____ $\frac{\mu Ci}{cc}$ / cpm

4. Determine flow rate for MSSVs. (Maximum flow rate of each MSSV is 1.46 E5 $\frac{cc}{sec}$)

Record in Step 5. _____ (number of MSSVs open) x 1 46 E5 $\frac{cc}{sec}$ = _____ $\frac{cc}{sec}$

5. Determine Release Rate of MSSVs and record in Step 8:

_____ $\frac{cc}{sec}$ x _____ $\frac{\mu Ci}{cc}$ / cpm x _____ cpm x 1.0 E-6 $\frac{Ci}{\mu Ci}$ = _____ $\frac{Ci}{sec}$

(From 4.) (From 3) (From 2.) (Release Rate)

6. Determine flow rate for AVVs (Check one), and record in Step 7

☐ One AVV open 9.5 E4 $\frac{cc}{sec}$ ☐ Two AVVs open 1.9 E5 $\frac{cc}{sec}$

ATTACHMENT 4: SECONDARY SIDE RELEASE CALCULATIONS
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DATA SHEET 7 (Continued)

7. Determine Release Rate for AVV and record in Step 8.

_____ $\frac{cc}{sec}$	x	_____ $\frac{\mu Ci}{cc}$	x	_____ cpm x 1.0 E-6 $\frac{Ci}{\mu Ci}$	=	_____ $\frac{Ci}{sec}$
(From 6.)		(From 3.)		(From 2.)		(Release Rate)

8. Determine Total Release Rate.

_____ $\frac{Ci}{sec}$	+	_____ $\frac{Ci}{sec}$	=	_____ $\frac{Ci}{sec}$
(From 5.)		(From 7.)		(Total Release Rate)

9. Perform one of the following:

   a. Insert the Release Rate into Step 4 of DATA SHEET 1, Attachment 3 and complete DATA SHEET 1.

   b. Plot the release rate on Scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2.

ATTACHMENT 4 SECONDARY SIDE RELEASE CALCULATIONS
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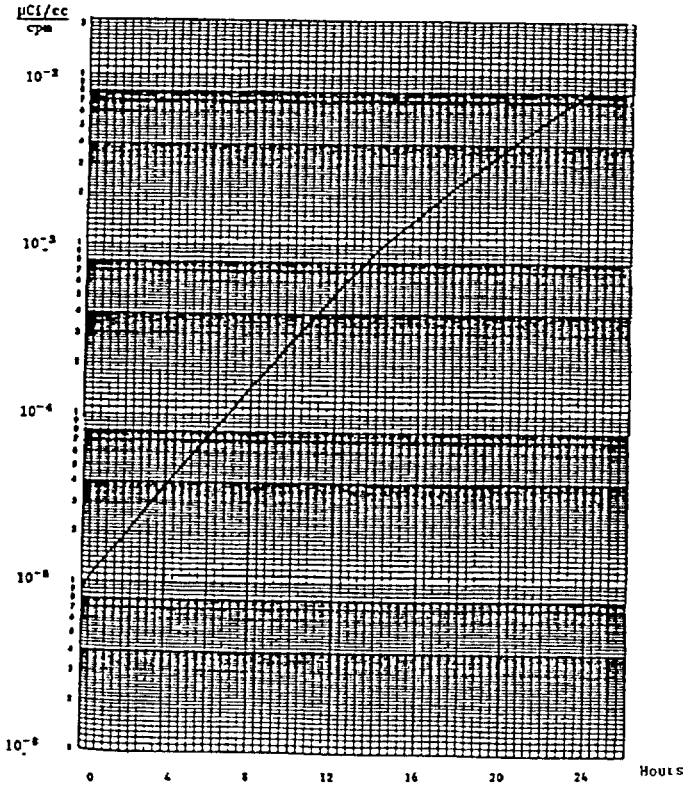
NORMAL REACTOR COOLANT ACTIVITY (0 1% FAILED FUEL) CONVERSION FACTOR vs TIME AFTER SHUTDOWN

Hours after Shutdown	µCi/cc cpm
0	9.00E-06
0.5	1.20E-05
1	1 42E-05
1 5	1.70E-05
2	1 95E-05
2 5	2 30E-05
3	2 75E-05
3 5	3 30E-05
4	3 95E-05
4 5	4 80E-05
5	5 70E-05
5.5	6 80E-05
6	8 20E-05
6.5	9.50E-05
7	1.10E-04
7 5	1 27E-04
8	1 50E-04

Hours after Shutdown	µCi/cc cpm
8 5	1 75E-04
9	2 02E-04
9 5	2.40E-04
10	2.80E-04
10 5	3.40E-04
11	3.90E-04
11 5	4.60E-04
12	5 30E-04
12 5	6 20E-04
13	7 02E-04
13 5	8 14E-04
14	9 50E-04
14.5	1 10E-03
15	1 25E-03
15.5	1 40E-03
16	1 60E-03

Hours after Shutdown	µCi/cc cpm
16 5	1 75E-03
17	1.95E-03
17 5	2.15E-03
18	2.45E-03
18 5	2.70E-03
19	3.00E-03
19 5	3.45E-03
20	3.75E-03
20 5	4 20E-03
21	4.55E-03
21 5	5.10E-03
22	5 60E-03
22 5	6 10E-03
23	6 60E-03
23 5	7 20E-03
24	8 00E-03

FIGURE 1



ATTACHMENT 5: CALCULATIONS FOR CONTAINMENT RELEASES USING RE 4596A OR RE 4596B

Page 1 of 6

NOTE

- Obtain containment radiation level from SPDS, Radiation Trends.
- Obtain containment pressure from SPDS, Containment Trends, or by accessing CRT DISPLAYS: points P314, P315, P316, and P317.

CAUTION

Use this attachment for the following conditions only:

- Station Vent Monitors are not available or
- It is known that the release is bypassing the Station Vent Monitors.

1. Record the date and time. Date _____ Time _____

2. Determine the containment radiation level: RE 4596A or RE 4596B (Circle one) and record in Step 6. _____ $\frac{Rem}{hr}$

3. Determine the elapsed time since the reactor was tripped or a significant downpower maneuver occurred (i.e., greater than 30%). _____ hours

4. IF containment spray is available, THEN use Figure 1, of this attachment, OTHERWISE use Figure 2 of this attachment

   Check one
   Figure 1. ☐ spray available
   Figure 2. ☐ no spray available

5. Determine the radiation monitor multiplication factor from Figure 1 or Figure 2 and record in Step 6.

   Xe-133 factor _____ I-131 factor _____

6. Determine the uncorrected release rate.

   _____ $\frac{Rem}{hr}$ x _____ = _____ $\frac{Ci}{sec}$

   (From 2.) Xe-133 Factor (From 5.) (Xe-133 Release Rate)

   _____ $\frac{Rem}{hr}$ x _____ = _____ $\frac{Ci}{sec}$

   (From 2.) I-131Factor (From 5.) (I-131 Release Rate)

ATTACHMENT 5 CALCULATIONS FOR CONTAINMENT RELEASES
USING RE 4596A OR RE 4596B
Page 2 of 6

NOTE 7
The prior calculation assumes the Technical Specification leak rate of 0.5% per day at 38 0 PSIG A leak area of 0.13 square inches should be used, unless it is known that additional leak paths from containment exist, and the leak area can be estimated The calculation provided in Step 7 may be utilized to correct for any leak area or containment pressure

7. IF conditions warrant,
THEN correct for containment pressure, and leak rate using the following equation:

a

XE-133 Uncorrected Release Rate (from 6) X Leak Area X $\sqrt{\frac{CTMT}{Pressure}}$ = XE-133 Corrected Release Rate

$\left[\frac{\quad Ci \quad}{sec}\right]$ X $\left[\frac{\quad in^2 \quad}{0.13\ in^2}\right]$ X $\sqrt{\left[\frac{\quad psig \quad}{38\ \ psig}\right]}$ = _____ $\frac{Ci}{sec}$

b.

I-131 Uncorrected Release Rate (from 6) X Leak Area X $\sqrt{\frac{CTMT}{Pressure}}$ = I-131 Corrected Release Rate

$\left[\frac{\quad Ci \quad}{sec}\right]$ X $\left[\frac{\quad in^2 \quad}{013\ in^2}\right]$ X $\sqrt{\left[\frac{\quad psig \quad}{38\ \ psig}\right]}$ = _____ $\frac{Ci}{sec}$

8 Record the wind speed.

Convert the wind speed from mph to m/sec.

_____ mph x 0 447 $\frac{m/sec}{mph}$ = _____ $\frac{m}{sec}$

(Wind Speed) (Wind Speed)

9. Record Stability Class (From Attachment 9) A B C D E F G
(Circle one)

ATTACHMENT 5: CALCULATIONS FOR CONTAINMENT RELEASES
USING RE 4596A OR RE 4596B
Page 3 of 6

10.	Using Table 1, enter the $\frac{\chi\mu}{Q}$ (m^{-2}) at distances of 0.75, 2, 5, and 10 miles for the Stability Class in step 9 in Column (B) of Tables 2 & 3.
11.	In Tables 2 & 3, divide Column (B) by Column (C) and enter in Column (D).
12.	In Tables 2 & 3, multiply Column (D) by Column (E) and enter in Column (F).
13.	Determine the appropriate Noble Gas Correction Factor and enter in Column (G) of Table 2. IF fuel damage or cladding failures have occurred, THEN, use Table 3 of Attachment 3 to obtain Noble Gas Correction Factor. Otherwise, use 10.0 for Noble Gas Correction Factor. Multiply Column (F) by Column (G) and enter in Column (H) of Table 2.
14.	Determine the appropriate I-131 Correction Factor from Table 6 of Attachment 3 and enter in Column (G) of Table 3. Multiply Column (F) by Column (G) and enter in Column (H) of Table 3.

ATTACHMENT 5 CALCULATIONS FOR CONTAINMENT RELEASES
USING RE 4596A OR RE 4596B
Page 4 of 6

TABLE 1. $\frac{\chi\mu}{Q}$ (m^{-2}) for Stability Classes as a Function of Downwind Distances

	STABILITY CLASS						
MILES	A	B	C	D	E	F	G
0 75	2.1E-6	1 4E-5	3.5E-5	9.9E-5	2 0E-4	4 5E-4	1.3E-3
2	1.1E-7	2 0E-6	5.8E-6	2.2E-5	4 6E-5	1 0E-4	2 8E-4
5	7.1E-9	3 2E-7	1.1E-6	5.5E-6	1 3E-5	3.1E-5	8.2E-5
10	8.9E-10	8.0E-8	3.2E-7	2.0E-6	5 1E-6	1 3E-5	3.4E-5

TABLE 2. Total Effective Dose Equivalent (Tede) Rate

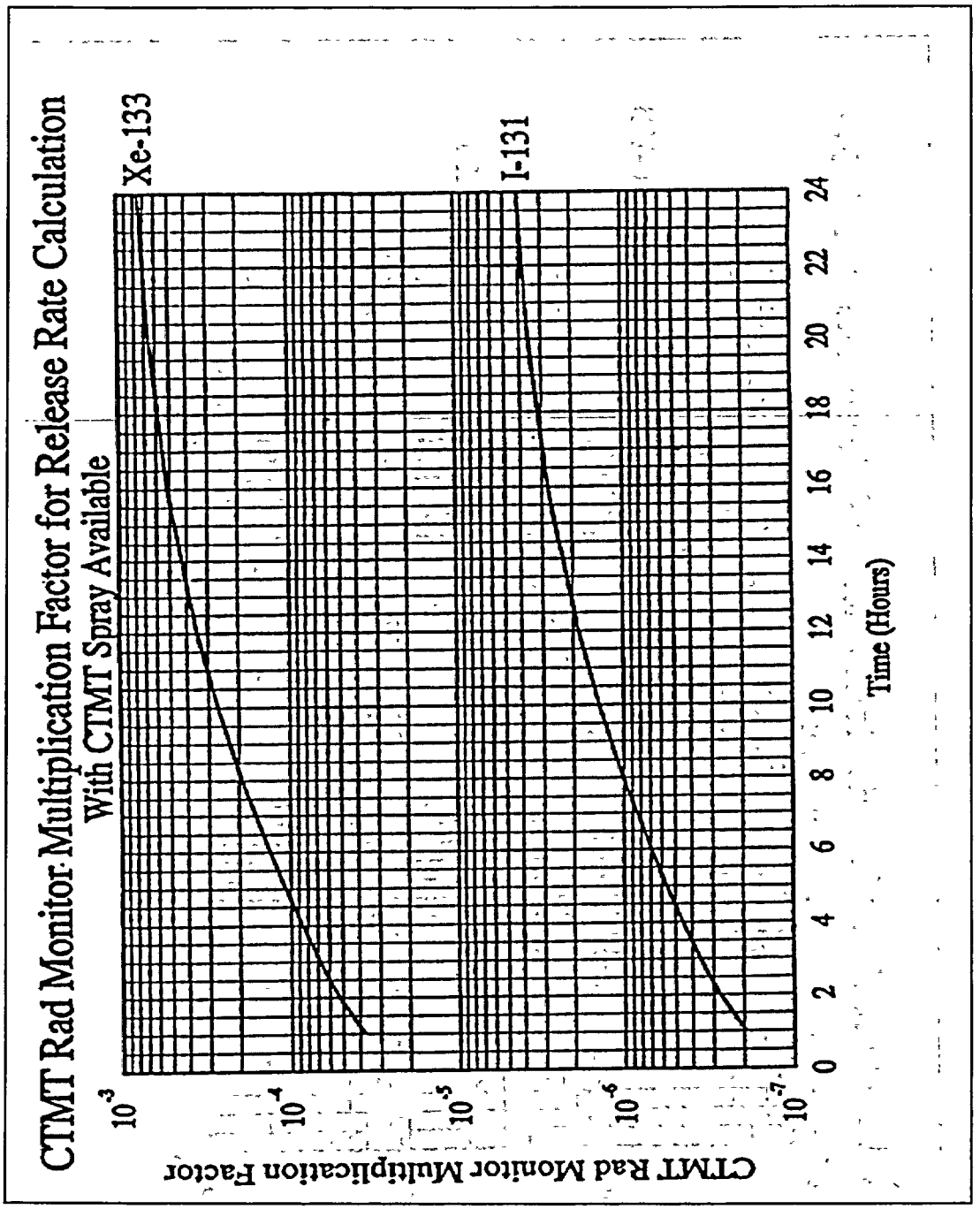
Column (A)	Column (B)	Column (C)	Column (D)	Column (E)	Column (F)	Column (G)	Column (H)
Downwind Distance (Miles)	$\frac{\chi\mu}{Q}$ (m^{-2})	Windspeed $\left(\frac{m}{sec}\right)$	$\frac{\chi}{Q}$ $\left(\frac{sec}{m^3}\right)$	Release Rate $\left(\frac{Ci}{sec}\right)$	Nobel Gas Conc. $\left(\frac{\mu Ci}{cc}\right)$	Noble Gas Correction Factor	TEDE Rate $\left(\frac{Rem}{hr}\right)$
N/A	From Table 1	From Step 8	B / C = D	From Step 7	D x E = F	From Att 3 Table 3	F x G = H
0.75							
2.00							
5 00							
10 00							

TABLE 3 Thyroid Dose Rate

Column (A)	Column (B)	Column (C)	Column (D)	Column (E)	Column (F)	Column (G)	Column (H)
Downwind Distance (Miles)	$\frac{\chi\mu}{Q}$ (m^{-2})	Windspeed $\left(\frac{m}{sec}\right)$	$\frac{\chi}{Q}$ $\left(\frac{sec}{m^3}\right)$	Release Rate $\left(\frac{Ci}{sec}\right)$	I-131 Conc. $\left(\frac{\mu Ci}{cc}\right)$	I-131 Correction Factor	Thyroid Dose Rate $\left(\frac{Rem}{hr}\right)$
N/A	From Table 1	From Step 8	B / C = D	From Step 7	D x E = F	From Att 3 Table 6	F x G = H
0.75							
2.00							
5.00							
10 00							

ATTACHMENT 5: CALCULATIONS FOR CONTAINMENT RELEASES
USING RE 4596A OR RE 4596B
Page 5 of 6

FIGURE 1



ATTACHMENT 5 CALCULATIONS FOR CONTAINMENT RELEASES
USING RE 4596A OR RE 4596B
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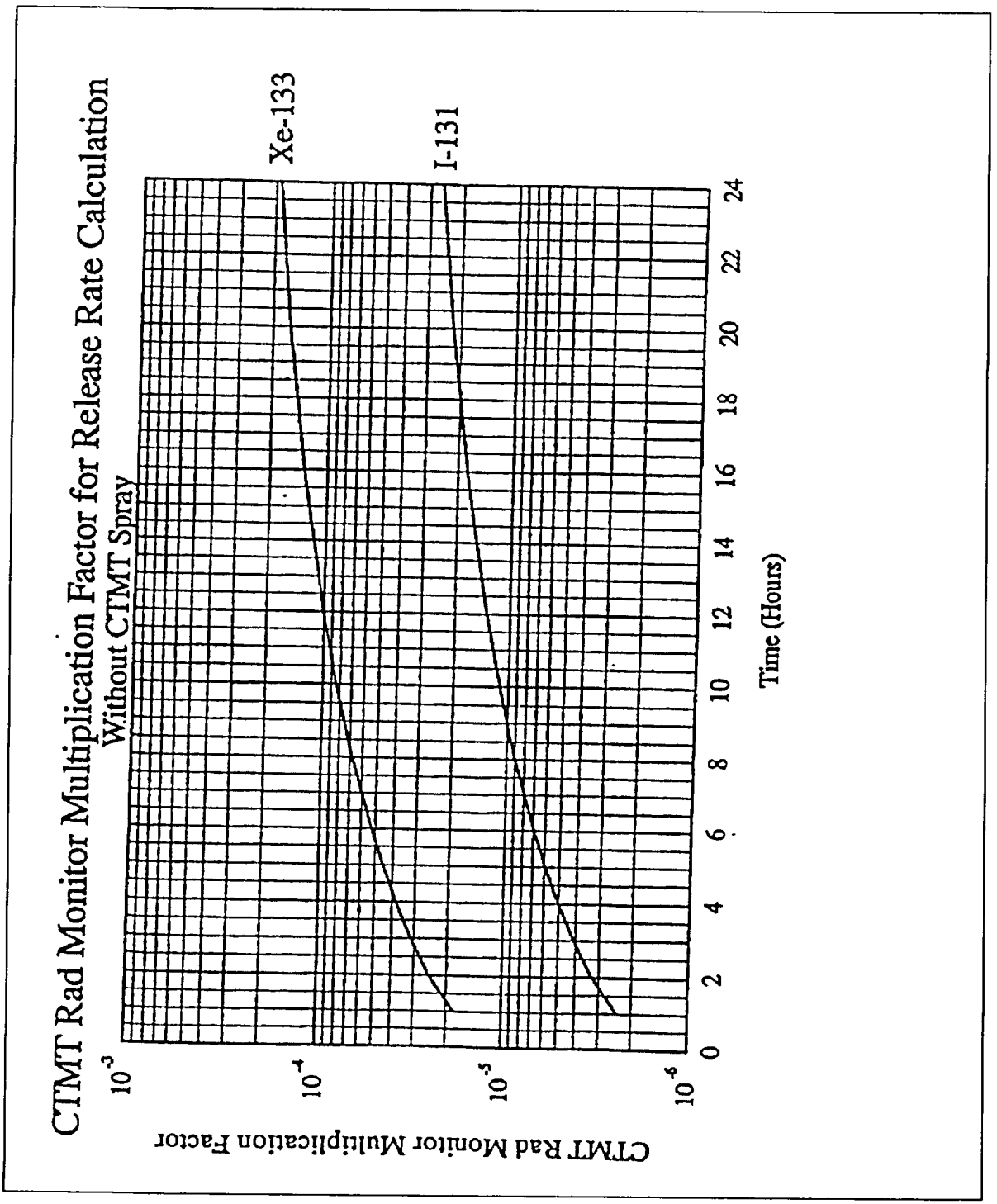
FIGURE 2



ATTACHMENT 6: CALCULATIONS FOR CONTAINMENT RELEASES USING RE 4597 AB OR RE 4597 BB

Page 1 of 1

1. Record the date and time. Date _____ Time _____

NOTE 2

- Obtain containment Noble Gas concentration from SPDS Radiation Trends.
- Obtain containment pressure from SPDS, Containment Trends; or by accessing CRT DISPLAYS: points P314, P315, P316 and P317.

2. Determine the Containment Noble Gas concentration from RE 4597 AB (Ch. 1 or Ch. 2) OR RE 4597 BB (Ch.1 or Ch.2)
(Circle instrument and channel used)
AND enter Containment Noble Gas concentration in Step 5.

_____ $\frac{\mu Ci}{cc}$

3. Determine the containment pressure in psia and convert to psig, if necessary.
_____ psia - 14.7 = _____ psig

4. Determine the Containment Leak Rate Fraction by multiplying the square root of containment pressure in PSIG times 8.3 E-4 and enter in Step 5.

$\sqrt{\text{\_\_\_\_\_}}$ psig x 8.3 E-4 = _____ leak rate
(From 3.) (fraction per day)

IF Containment pressure cannot be obtained,
THEN use 5.0 E-3 leak rate fraction per day and enter leak rate fraction in Step 5.

5. Determine the Release Rate from containment.

$0.928 \frac{cc\ Ci}{sec\ \mu Ci}$ x _____ x _____ $\frac{\mu Ci}{cc}$ = _____ $\frac{Ci}{sec}$
(From 4) (From 2) (Release Rate)

6. Perform one of the following:
   a. Insert the Noble Gas Release Rate into Step 4 of DATA SHEET 1 of Attachment 3 and complete DATA SHEET 1.
   b. Plot the release rate on Scale (C) of the Offsite Dose Assessment Nomogram and complete Attachment 2.

ATTACHMENT 7 DOSE PROJECTIONS BASED ON FIELD MONITORING DATA
Page 1 of 4

NOTE

This calculation does not include that contribution to TEDE from radioiodide internal exposure. The maximum amount of difference associated with this assumption is 3% of the total

TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE)

1. Record date and time Date _____ Time _____

2. Record the distance downwind that the sampling location lies from the release point (to the nearest ½ mile) _____ miles.

3. Record Stability Class (From Attachment 9, Meteorological Data, Step 4)
(circle one) A B C D E F G

4 Record survey meter reading (closed-window) (A)_____ $\frac{mREM}{hr}$
Record 0.75 mile, 2mile, 5 mile, 10 mile values in Column (A) of Table 1

5 Record $\frac{\chi\mu}{Q}$ (meter^{-2}) value at the sampling location (from Table 4 of this attachment)

(B)_____ $\frac{\chi\mu}{Q}$ (m^{-2})

Record 0.75 mile, 2mile, 5 mile, 10 mile values in Column (B) of Table 1

6. Record $\frac{\chi\mu}{Q}$ (m^{-2}) values for 0.75, 2, 5, and 10 miles in column (C) (from Table 4 of this attachment).

7 Divide (A) by (B) and multiply by (C) then divide by 1000 to obtain the TEDE rate for each downwind distance below and record in Column (D).

Table 1. TEDE Rate

	(A)	(B)	(C)	(D)
	$\frac{mREM}{hr}$	$\frac{\chi\mu}{Q}$ (m^{-2})	$\frac{\chi\mu}{Q}$ (m^{-2})	$\frac{REM}{hr}$
Downwind Distance	From Step 4	From Step 5	From Table 4	($\frac{A}{B}$ x C – 1000 = $\frac{REM}{hr}$)
0 75 mile				
2 mile				
5 mile				
10 mile				

ATTACHMENT 7: DOSE PROJECTIONS BASED ON FIELD MONITORING DATA
Page 2 of 4

THYROID DOSE RATE (CDE)

1. Record date and time. Date _____ Time _____

2. Record sample: start time. _____ stop time. _____

3. Record net reading of air sampler cartridge _____ net cpm.

4. Record air sampler flow rate _____ CFM.

5. Record sample collection time _____ minutes.

6. Determine Sample volume _____ CFM x _____ minutes = _____ ft^3
   Flowrate (From 4.) | Collection Time (From 5.) | (Total Volume)

7. Multiply the net cpm reading by 4.2 E-9 $\frac{\mu Ci}{cc} \frac{ft^3}{cpm}$ and divide by the sample volume.

   _____ net cpm x 4.2 E-9 ÷ _____ ft^3 = _____ $\frac{\mu Ci}{cc}$
   Net Reading (From 3.) | Sample Volume (From 6.) | (Iodine Air Conc.)

8. Record the distance downwind that the sampling location lies from the release point (to the nearest ½ mile) _____ miles.

9. Record Stability Class (from Attachment 9, Meteorological Data, Step 4)
   (circle one) A B C D E F G

10. Multiply Iodine Air Concentration by the appropriate correction factor from Table 6. of Attachment 3 to obtain Thyroid Dose Rate at sampling location.

    _____ $\frac{\mu Ci}{cc}$ x _____ = (A) _____ $\frac{REM}{hr}$
    Iodine Air Conc. (From 7) | from Table 6. of Attachment 5

    Record above value (A) in Column A of Table 2.

11. Record $\frac{\chi\mu}{Q}$ (m^{-2}) value at the sampling location (from Table 4. of this attachment)

    (B) _____ $\frac{\chi\mu}{Q}$ (m^{-2})

    Record above value (B) in Column B of Table 2.

ATTACHMENT 7: DOSE PROJECTIONS BASED ON FIELD MONITORING DATA
Page 3 of 4

12 Record $\frac{\chi\mu}{Q}$ (m^{-2}) values for 0 75, 2, 5, and 10 miles in Column (C) (from Table 4. of this attachment)

13 Divide (A) by (B), and multiply times (C) to obtain Thyroid Dose Rate (D) [Committed Dose Equivalent (CDE)]

Table 2. Thyroid Dose Rate

Downwind Distance	A $\frac{mREM}{hr}$	B $\frac{\chi\mu}{Q}$ (m^{-2})	C $\frac{\chi\mu}{Q}$ (m^{-2})	D $\frac{REM}{hr}$
	From Step 10	From Step 11	From Step 12	($\frac{A}{B}$ x C = $\frac{REM}{hr}$)
0.75 mile				
2 mile				
5 mile				
10 mile				

14 Total Organ Dose Equivalent (TODE) to the Thyroid is equal to:

$TEDE_r$ + CDE_{tr} = $TODE_{tr}$
(REM/hr) (REM/hr) (REM/hr)

$TODE_{tr}$ = Total Organ Dose Equivalent (TODE) to the Thyroid at distance r
$TEDE_r$ = Total Effective Dose Equivalent (TEDE) at distance r
CDE_{tr} = Committed Dose Equivalent (CDE) to the Thyroid at distance r

Table 3 TODE to the Thyroid

Downwind Distance	$TEDE_r$ ($\frac{REM}{hr}$)	CDE_{tr} ($\frac{REM}{hr}$)	$TODE_{tr}$ ($\frac{REM}{hr}$)
0 75 mile			
2 mile			
5 mile			
10 mile			

ATTACHMENT 7: DOSE PROJECTIONS BASED ON FIELD MONITORING DATA
Page 4 of 4

Table 4. $\frac{\chi\mu}{Q}$ (m^{-2}) for Various Stability Classes as a Function of Distance

	Stability Class						
MILES	A	B	C	D	E	F	G
0.75	2.1E-6	1.4E-5	3.5E-5	9.9E-5	2.0E-4	4.5E-4	1.3E-3
1	9.0E-7	8.0E-6	2.1E-5	6.3E-5	1.3E-4	2.9E-4	8.0E-4
1.5	2.6E-7	3.6E-6	9.8E-5	3.3E-5	7.0E-5	1.6E-4	4.3E-4
2	1.1E-7	2.0E-6	5.8E-6	2.2E-5	4.6E-5	1.0E-4	2.8E-4
2.5	5.7 E-8	1.3E-6	3.9E-6	1.5E-5	3.3E-5	7.7E-5	2.1E-4
3	3.3 E-8	8.9E-7	2.8E-6	1.2E-5	2.6E-5	6.0E-5	1.6E-4
3.5	2.1E-8	6.5E-7	2.1E-6	9.3E-6	2.1E-5	4.9E-5	1.3E-4
4	1.4E-8	5.0E-7	1.7E-6	7.6E-6	1.7E-5	4.1E-5	1.1E-4
4.5	9.8E-9	4.0E-7	1.3E-6	6.4E-6	1.5E-5	3.5E-5	9.4E-5
5	7.1E-9	3.2E-7	1.1E-6	5.5E-6	1.3E-5	3.1E-5	8.2E-5
5.5	5.4E-9	2.7E-7	9.3E-7	4.8E-6	1.1E-5	2.7E-5	7.3E-5
6 & 6.5	3.8E-9	2.1E-7	7.5E-7	4.0E-6	9.5E-6	2.3E-5	6.2E-5
7 & 7.5	2.4E-9	1.5E-7	5.6E-7	3.2E-6	7.8E-6	1.9E-5	5.1E-5
8 & 8.5	1.6E-9	1.2E-7	4.5E-7	2.6E-6	6.6E-6	1.7E-5	4.3E-5
9 & 9.5	1.1E-9	9.4E-8	3.7E-7	2.2E-6	5.6E-6	1.5E-5	3.8E-5
10	8.9E-10	8.0E-8	3.2E-7	2.0E-6	5.1E-6	1.3E-5	3.4E-5

ATTACHMENT 8· ESTIMATION OF TOTAL POPULATION DOSE

NOTE

Use this attachment during Recovery, as a first estimate of Total Population dose from the release.

____ 1. IF the Safety Parameter Display System (SPDS) is available,
GO TO Step 2, SPDS Calculation,
OTHERWISE, GO TO Step 3, Manual Calculation

2 SPDS Calculation

____ a Click the DOSE CALCU tab on the SPDS Process Book

____ b. Double click on the POPULATION DOSE choice

____ c Select the Total Dose tab and perform the following actions:

_____ (1) Select desired RE 4598 Channel (A or B)

_____ (2) Verify Date of Exposure

_____ (3) Verify Time exposure began (HH MM)

_____ (4) Verify Release duration

_____ (5) Verify Date of Reactor Trip

_____ (6) Verify Time of Reactor Trip (HH MM)

_____ (7) Click the CALCULATE DOSE button

_____ (8) Select AUTOMATIC or MANUAL calculations

_____ (9) Select the desired sector

NOTE 2 c (10):
The number of persons per sector can be obtained from local officials or from the "Development of Evacuation Time Estimates for Davis-Besse Nuclear Power Station.

_____ (10) IF MANUAL was selected in step 2.c. (8)
THEN fill-in the Number of Persons for each Mile column on the TOTAL EFFECTIVE DOSE EQUILAVENT table
OTHERWISE, N/A this step

_____ (11) Click the ADD TO CUMULATIVE WORKSHEET button

_____ (12) Repeat steps (9) through (11) for desired sector(s)

_____ (13) Select Cum Exposure tab to determine total cumulative dose for selected sector(s)

_____ (14) To clear Cumulative Exposure Worksheet:

_____ (a) Select Total Dose tab

_____ (b) Click the CLEAR CUMULATIVE WORKSHEET button

ATTACHMENT 8: ESTIMATION OF TOTAL POPULATION DOSE
Page 2 of 4

NOTE

Use this attachment during Recovery, as a first estimate of Total Population dose from the release

3. Sector Worksheet Instructions

____ a. Record Total Effective Dose Equivalent (TEDE) or thyroid dose rate for a given release in REM/hr in Column (A).

(1) Use the 0.75 mile TEDE and thyroid dose rates for the 0-2 mile population, the 2 mile TEDE and thyroid dose rates for the 2-5 mile population, and the 5 mile TEDE and thyroid dose rates for the 5-10 mile population for conservatism.

____ b. Multiply Column (A) times exposure duration and record in Column (B).

____ c. Record the number of persons in the affected sector for the given distance and time of exposure in Column (C).

(1) IF an evacuation has occurred,
THEN local officials may have the number of individuals remaining in the sector.

(2) IF an evacuation has not occurred,
OR local officials do not have the required information,
THEN take the data from "Development of Evacuation Time Estimates for Davis-Besse Nuclear Power Station".

____ d. Multiply Column (B) times Column (C) and record in Column (D).

____ e. Total the Column (D) values.

____ f. Enter the Column (D) values on the appropriate Cumulative Exposure Worksheet, of this attachment.

ATTACHMENT 8 ESTIMATION OF TOTAL POPULATION DOSE
Page 3 of 4

1. Date of exposure: _____ Sector: _____

2 Time exposure began: _____

3 Exposure duration _____hours

TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE)

	(A)	(B)	(C)	(D)
Mile	$\frac{\text{REM}}{\text{hr}}$	REM	Number of Persons	PERSON-REM
0-2				
2-5				
5-10				

Total Effective Dose Equivalent (TEDE) PERSON-REM_____

THYROID

	(A)	(B)	(C)	(D)
Mile	$\frac{\text{REM}}{\text{hr}}$	REM	Number of Persons	PERSON-REM
0-2				
2-5				
5-10				

Total Thyroid PERSON-REM_____

ATTACHMENT 8: ESTIMATION OF TOTAL POPULATION DOSE

Cumulative Exposure Worksheet

1. Record the total PERSON-REM values from each Sector Worksheet. Sum the total PERSON-REM values to obtain the estimated Total Population Dose.

Date/Time/Sector	TEDE PERSON-REM	Total Thyroid PERSON-REM

Total __________ __________

Date Completed________________ Name____________________

ATTACHMENT 9: METEOROLOGICAL DATA
Page 1 of 3

1 Obtain 15 minute average meteorological data from any of the following

- Access the SPDS Process Book to access the meteorological data
- Access the DADS nongraphic terminal to call up the meteorological data

2 IF the systems in Step 1 cannot be accessed,
THEN obtain meteorological data from the following

a Access data from the Meteorological Tower using the points listed below:

Parameters	MET Tower Points
Wind Speed, 612' Elevation, in MPH	M006
Wind Speed, 827' Elevation, in MPH	M005
Wind Direction, 612' Elevation, in degrees	M003
Wind Direction, 827' Elevation, in degrees	M002
Ambient Temperature, 612' Elevation, in °F	M012
Temp. Differential, 827'-612', in °F	M011
Temp. Differential, 917'-612', in °F	M010

b. Contact the National Weather Service, or equivalent, using the Emergency Plan Telephone Directory.

3 Use wind speed and wind direction from one of the following elevations of the Meteorology Tower, in order of preference

a 10 meters (612 feet above sea level)

b. 75 meters (827 feet above sea level)

c. 100 meters (917 feet above sea level)

d Use conservative wind speed of 2 mph (0 9 m/s)

4 Obtain atmospheric Stability Class from one of the following indicators in order of preference.

a Lower delta T (827' - 612') (see Table 1)

b. Upper delta T (917' - 612') (see Table 2.)

c. Standard deviation of wind direction from 10 meter elevation (see Table 3)

d Use conservative Stability Class of F

ATTACHMENT 9: METEOROLOGICAL DATA
Page 2 of 3

5. For Periodic Updates, contact the National Weather Service (NWS), or equivalent, to investigate upcoming weather conditions.

   a. The NWS telephone number is listed in the Emergency Plan Telephone Directory in the Other Resources Section.

6. IF in the Emergency Control Center/Emergency Operations Facility (ECC/EOF), THEN determine if a lake breeze is occurring by looking for the following simultaneous conditions:

   a. Calendar date between March 15 and September 15.

   b. Time of day between sunrise and sunset.

   c. Wind direction from between 0° to 90°.

   d. Wind speed less than 12 mph.

   e. Wind speed decreases with height on Meteorological Tower.

   f. Stability Class A through D.

7. IF a lake breeze is occurring while an airborne radioactive release is in progress or imminent, THEN the Dose Assessment Coordinator should:

   a. Inform the Ohio EMA of the lake breeze and that the plume may not follow the course indicated by the Meteorological Tower wind direction.

   b. Inform the Radiation Monitoring Teams (RMTs) that higher-than-projected dose rates may occur in the plume pathway.

ATTACHMENT 9 METEOROLOGICAL DATA
Page 3 of 3

Table 1. Stability Class from Lower Differential Temperature

Stability Class	Description	Range ΔT°F/(75-10)m
A	Extremely unstable	ΔT ≤ -2 2
B	Moderately unstable	-2 2 < ΔT ≤ -2 0
C	Slightly unstable	-2 0 < ΔT ≤ -1 7
D	Neutral	-1 7 < ΔT ≤ -0 6
E	Slightly stable	-0 6 < ΔT ≤ 1 7
F	Moderately stable	1 7 < ΔT ≤ 4 6
G	Extremely stable	4 6 < ΔT

Table 2. Stability Class from Upper Differential Temperature

Stability Class	Description	Range ΔT°F/(100-10)m
A	Extremely unstable	ΔT ≤ -3 1
B	Moderately unstable	-3 1 < ΔT ≤ -2 8
C	Slightly unstable	-2 8 < ΔT ≤ -2.5
D	Neutral	-2.5 < ΔT ≤ -0.8
E	Slightly stable	-0.8 < ΔT ≤ 2.5
F	Moderately stable	2.5 < ΔT ≤ 6.6
G	Extremely stable	6.6 < ΔT

Table 3. Stability Class from Standard Deviation of Wind Direction

Stability Class	Description	Range
A	Extremely unstable	SD ≥ 22 5
B	Moderately unstable	22.5 > SD ≥ 17 5
C	Slightly unstable	17.5 > SD ≥ 12 5
D	Neutral	12 5 > SD ≥ 7.5
E	Slightly stable	7 5 > SD ≥ 3 8
F	Moderately stable	3 8 > SD ≥ 2 1
G	Extremely stable	2 1 > SD

COMMITMENTS

Step Number	Reference	Comments
Attachment 5	TERMS O 13593	Distance calculation methodology has been reexamined for compatibility with RA-EP-02245
Attachment 3	TERMS O 13594	Output data (dose rate) has been made consistent throughout this procedure
Attachment 5, Attachment 6	TERMS O 13539	Dose rates based on CTMT dome monitor and CTMT atmosphere sampling system
Step 6.3.3	TERMS O 14992	Addresses lake breeze
Attachment 3	TERMS O 13506	Noble gas correction factor which changes with time after reactor shutdown

Davis-Besse Nuclear Power Station

EMERGENCY PLAN IMPLEMENTING PROCEDURE

RA-EP-02710

REENTRY

REVISION 01

Prepared by: B.W. Cope

Procedure Owner: Manager - Security

Effective Date: NOV 20 2002

Procedure Classification:

X Safety Related

_____ Quality Related

_____ Non-Quality Related

LEVEL OF USE:

IN-FIELD REFERENCE

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1.0 PURPOSE

This procedure provides guidance for reentry into the Davis-Besse Nuclear Power Station (DBNPS) after the emergency situation is under control.

2.0 REFERENCES

2.1 Departmental

2.1.1 DB-HP-01201, Administrative Dose Control Levels

2.1.2 RA-EP-02410, Operations Support Center Activation and Response

2.1.3 RA-EP-02620, Emergency Dose Control and Potassium Iodide Distribution

2.1.4 RA-EP-02640, Station Radiological Surveys and Controls During Emergencies

2.1.5 RA-EP-02720, Recovery

2.2 Manuals

2.2.1 DBNPS Emergency Plan

2.2.2 Corporate Emergency Response (CER) Plan, Davis-Besse Nuclear Power Station (DBNPS)

3.0 DEFINITIONS

3.1 REENTRY – Reentry into the DBNPS site to perform certain essential actions which could not be performed coincident with the immediate response to the emergency. Reentry is made when the emergency situation is under control and more deliberate planning can be made for the activities to be performed. Reentry may occur before termination of the emergency or it may be conducted as part of the Recovery.

4.0 RESPONSIBILITIES

4.1 For reentry activities conducted before termination of the emergency and the initiation of Recovery, the Emergency Plant Manager shall be responsible for authorizing reentry and implementing this procedure. He shall inform the Emergency Director that reentry is being initiated.

4.2 For reentry activities conducted during Recovery, the Plant Recovery Manager shall be responsible for implementation of this procedure, and shall ensure that the Recovery Director remains informed.

4 3 The Emergency Radiation Protection (RP) Manager and the Operations Support Center Radiation Protection (OSC RP) Coordinator shall plan the personnel radiological protection aspects of reentry into the DBNPS and appoint OSC RP Briefer/Debriefers.

4 4 The OSC Manager shall coordinate reentry activities and ensure that all reentry teams have been adequately briefed and debriefed on their return

4.5 The Supervisor – Emergency Preparedness shall be responsible for the accumulation and submittal of Quality Assurance Records and other records deemed necessary to Nuclear Records Management

5 0 INITIATING CONDITIONS

This procedure shall be initiated when the emergency situation is under control and conditions exist which require entry into Station areas that have been evacuated due to adverse conditions or have been closed to personnel during an emergency.

6.0 PROCEDURE

6.1 Emergency Plant Manager/Plant Recovery Manager

The Emergency Plant Manager or if recovery has been initiated, the Plant Recovery Manager should:

6.1.1 Consult with the other emergency response personnel before reentry and review the following:

a. Available surveillance data to determine the plant areas actually or potentially affected by radiation and/or contamination.

> CAUTION 6.1.1.b
>
> The use of personnel who have a high cumulative radiation dose shall be minimized. Every effort shall be made to maintain radiation dose within the limits specified in DB-HP-01201. The Emergency Director shall be notified, and his approval obtained, before any planned radiation dose in excess of applicable limits specified in RA-EP-02620.

b. Radiation dose of personnel who shall participate in reentry operations to determine additional personnel requirements.

c. The adequacy of radiation survey instrumentation, equipment and any special dosimetry requirements.

d. Primary and backup communications methods.

e. Known or potential hazards to personnel.

6.1.2 Authorize all entries into evacuated areas of DBNPS in accordance with RA-EP-02720, if recovery has been initiated.

6.1.3 Approve and prioritize all reentry team tasks. Initial reentry team goals typically include the following:

a. Determination of the initial objectives required for recovery operations.

b. Observation of hazards or potential hazards associated with the recovery.

c. Obtaining a comprehensive radiation surveillance of DBNPS facilities.

d. Isolating and posting of radiological and safety hazards.

NOTE 6.1.4

Non-emergency limits for radiation dose shall be considered applicable for reentry activities, except under extreme circumstances Refer to DB-HP-01201

6.1.4 Review and approve, as appropriate, any radiation dose in excess of applicable limits

6.1 5 Keep the Emergency Director or Recovery Director informed of significant events.

6 2 Emergency RP Manager/OSC RP Coordinator

The Emergency RP Manager and/or the OSC RP Coordinator should:

6 2 1 Establish guidelines to ensure that reentry operations are conducted in a manner to minimize radiation dose to personnel

6.2.2 Provide radiological controls coverage for all reentry teams in accordance with RA-EP-02640

6.2 3 Ensure that the OSC Briefer/Debriefer adequately briefs reentry personnel on radiological hazards before they enter the RRA using the Emergency Team Briefing Form, DBEP-024

6 2 4 Ensure that the OSC Team Briefer/Debriefer is informed of any significant changes in conditions so that all subsequent teams have access to the most current information

6 3 OSC Manager

6.3 1 Oversee the activities of the OSC in accordance with RA-EP-02410

6.3 2 Update the Emergency Plant Manager or Recovery Manager periodically on current plant conditions and the status of the reentry teams

6.4 Assistant OSC Manager

The Assistant OSC Manager should:

6.4.1 Designate members of the reentry teams.

6.4.2 Reentry Teams shall consist of a minimum of two people:

a. One member trained in radiation protection.

b. The second member will depend on the specific tasks to be accomplished.

6.4.3 A Standby Team shall be designated and briefed with the reentry team on known or potential hazards, and kept informed of the reentry team's location so that they can provide rescue and first aid assistance at all times. The Standby Team shall consist of at least two members:

a. One trained in radiation protection.

b. One trained in first aid.

6.4.4 Ensure the OSC Team Briefer/Debriefer adequately briefs reentry personnel on the maintenance and/or operation objectives of the mission, unsafe conditions and appropriate safety precautions using the Emergency Team Briefing Form, DBEP-024.

6.4.5 After obtaining approval from the Emergency Plant Manager or Plant Recovery Manager, dispatch the Reentry Team(s).

6.4.6 Maintain communications with the reentry teams.

6.4.7 Keep the OSC Manager informed of reentry team activities.

6.4.8 Ensure the OSC Team Briefer/Debriefer interviews teams on their return using the Emergency Team Debriefing Form, DBEP-024.

6.5 OSC Team Briefer/Debriefer

The OSC Team Briefer/Debriefer should:

6.5.1 Ensure that reentry teams are adequately briefed using the Emergency Team Briefing Form, DBEP-024:

a. Areas to be surveyed.

b. Anticipated routes to the area.

c. Anticipated radiation and contamination levels expected.

d. Required equipment.

e. Shielding requirements and availability.

f. Protective clothing and equipment required (PCs, SCBA, etc.)

g. Access Control procedures

h Exposure control limits and personnel dosimetry required

i. Decontamination requirements.

j Primary and backup communications methods

k. Known or potential hazards and appropriate safety precautions.

6 5 2 Interview the team(s) on their return, and document all pertinent information on the Emergency Team Debriefing Form, DBEP-024

6 5 3 Ensure that the team(s) are informed of any significant changes in conditions.

6 5 4 Report the results of the reentry to the OSC Manager or the RP Coordinator if the Recovery Organization is in place, for further dissemination to appropriate individuals.

6.6 Reentry Team(s)

Reentry Team(s) should:

6 6 1 Assemble all the necessary equipment according to the Emergency Team Briefing Form, DBEP-024 and verify operability of equipment.

WARNING 6.6.2

If dose rates encountered exceed the limits established during reentry planning, reentry personnel shall:

1. Exit the area immediately.
2. Return to a safe area.
3. Contact the OSC Manager for further instructions.

6.6.2 Enter the area when authorized by the Emergency Plant Manager or Recovery Manager.

6.6.3 Conduct a radiation survey of the area in accordance to RA-EP-02640.

6.6.4 Perform first aid and rescue operations, if necessary.

6.6.5 Assess the following items as directed:

a. Condition of plant equipment and areas

b. Potential for additional problems

c. Consequences of damage which occurred during the emergency

d. Accessibility of affected areas

e. Radiological, toxic, structural or other hazards

f. Other potential personnel or equipment hazards

6.6.6 Perform inspections, repairs and operations as directed.

6.6.7 Maintain communications with the Assistant OSC Manager or OSC RP Coordinator, providing observed conditions and dose rates.

6.6.8 Isolate and post appropriate areas with the proper radiation warning signs and barrier ropes as Radiation, High Radiation and/or Contamination areas.

6.6.9 Return to the OSC for debriefing after completion of assigned tasks.

7 0 FINAL CONDITIONS

This procedure should be terminated when

7.1 Reentry operations have been completed and all reentry team members have been accounted for

7.2 Debriefing of reentry personnel has been completed and documented.

7.3 Records generated during the emergency are forwarded to the Supervisor – Emergency Preparedness after review by the Emergency RP Manager and OSC Manager.

7 4 Emergency equipment has been inventoried and deficiencies identified and reported to the Supervisor – Emergency Preparedness

7 5 Procedural deficiencies have been identified and reported to the Supervisor – Emergency Preparedness.

8 0 RECORDS

8 1 The following quality assurance records are completed by this procedure and shall be listed on the Nuclear Records List, captured, and submitted to Nuclear Records Management in accordance with NG-NA-00106

8.1.1 None

8.2 The following non-quality assurance records are completed by this procedure and may be captured and submitted to Nuclear Records Management in accordance with NG-NA-00106

8 2 1 None

COMMITMENTS

Step Number	Reference	Comments
None	None	None

END