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PLANT OPERATIONS MANUAL

Volume 10

10-S-01-12

Section 01

Revision: 039

Date: 12-10-08

REFERENCE USE

EMERGENCY PLAN PROCEDURE

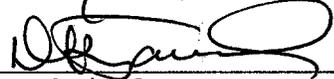
RADIOLOGICAL ASSESSMENT AND PROTECTIVE ACTION RECOMMENDATIONS

SAFETY RELATED

Prepared:



Reviewed:



Technical

Approved:



Manager, Emergency Preparedness

List of Effective Pages:

Pages 1-18

Attachments I-VII

List of TCNs Incorporated:

<u>Revision</u>	<u>TCN</u>
1-4	None
5	1
6-10	None
11	2
12	3,4
13-15	None
16	5
17-039	None

Title: Radiological Assessment And Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: i
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RPTS FORM

REQUIRED REVIEW PERFORMED (Check all that apply)	<input checked="" type="checkbox"/> PAD (EN-LI-100)	<input type="checkbox"/> 50.59 Evaluation (EN-LI-101)
	<input type="checkbox"/> 72.48 Evaluation (EN-LI-112)	<input checked="" type="checkbox"/> 50.54 Evaluation (ENS-NS-210)
Transmit applicable Review Form as a separate record along with procedure to Document Control.	<input type="checkbox"/> PAD Not Required (EN-LI-100 or 01-S-02-3) <ul style="list-style-type: none"> <input type="checkbox"/> Process Applicability Excluded <input type="checkbox"/> Editorial Change <input type="checkbox"/> ISI/IST Implementation <input type="checkbox"/> TCN Incorporation or Auto Rev. <input type="checkbox"/> Other Process-Number: _____ 	
	PAD Reviewer: _____ / _____ (for PAD Not Required) Signature/Date	

Cross-Discipline review required?	() Yes	(Note affected Departments Below)
	(X) No	
Preparer Initials>>>	TOV	

Department Cross-Discipline Reviews Needed	Signoff (signed, electronic, telcon)

Does this directive contain Tech Spec Triggers? () YES (X) NO

REQUIREMENTS CROSS-REFERENCE LIST

Requirement Implemented Name	by Directive Paragraph Number	Directive Paragraph Number That Implements Requirement
GGNS Emer Plan	7.6.1.e.2	*
GGNS Emer Plan	7.6.1.c.S6	Attachment I
GGNS Emer Plan	7.6.1.b.S5	Attachment I
GGNS Emer Plan	6.5.1.b.S5,S6,S7	6.2.1
AECM 84/0397	P2, Para.1	Attachment II, 6.1.7
GNRO-97/00080	97-09-01.Item4	6.1, Attachment II
GNRO-97/00113	97-15-03.Item2	5.21, 6.1(Note), 6.1.4, 6.1.7, Attachment II, 6.2.4
GNRI-97/00162	IFI 97-15-03	6.2.4(Note)
GNRI-97/00162	IFI 97-15-04	6.1 (Note)
CR-GGN-1999-0656	CA.2	6.4
CR-GGN-2000-1317	CA.12	5.17, 6.1.6(Note), 6.1.7(Note)
CR-GGN-2002-0236	CA. 2	Attachment V
CR-GGN-2002-0238	CA. 3	Attachment I Section 2.1 (Note)
CR-GGN-2005-0316	CA. 3	6.1.4.a (1), Attachment I - 2.3.2
CR-GGN-2004-4118	CA. 5	6.1.7.e.(2)

* Covered by directive as a whole or by various paragraphs of the directive.

Title: Radiological Assessment And Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: ii
--	-----------------	---------------	----------

NOTE

The Equipment Database (EDB) Request statement is applicable only to Volume 06 and 07 maintenance directives.

EDB Change Request generated and the backup documentation available for setpoint and/or calibration data only Yes N/A EDBCR # _____

Current Revision Statement

Revision 039:

Adds initial notification that the TSC/EOF is operable, and final notification that the TSC/EOF is deactivated, to Attachment II (SRAO Trigger Points)

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 1
--	-----------------	---------------	---------

Table of Contents

1.0 Purpose and Discussion	2
2.0 Responsibilities	2
3.0 References	3
4.0 Attachments	3
5.0 Definitions	3
6.0 Details	5
6.1 Radiological Assessment Process	5
6.2 Protective Actions	11
6.3 Meteorological Data	15
6.4 Determining if a Release Is In Progress	16
6.5 Liquid Releases	16
6.6 Securing From a Release	17
6.7 Completing The Notification Form	17
6.8 Records and Information	18

Attachments

Attachment I	Dosecalc Instructions and Information
Attachment II	SRAO Trigger Points
Attachment III	MET Instrument Determination
Attachment IV	Stability Class Determination
Attachment V	Wind Shift Examples
Attachment VI	Sectors to Include on Notification Form
Attachment VII	Release Characterization

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 2
--	-----------------	---------------	---------

1.0 PURPOSE AND DISCUSSION

1.1 PURPOSE

- 1.1.1 To provide guidance for performing Radiological Assessment during emergencies.
- 1.1.2 Guidance is provided for:
 - a. Assessment of radiological release conditions.
 - b. Use of radiological data from effluent monitors (ERFIS), Containment ARMs, and Radiological Monitoring Teams in the estimates of offsite doses.
 - c. Use of actual, and estimation of, meteorological conditions and their application to the estimates of offsite doses.
 - d. Application of projected dose to Protective Action Guides and subsequent Protective Action Recommendations.
 - e. Recognizing radiological conditions that require notification of the State Radiological Assessment Officer
- 1.1.3 To provide instructions for performing offsite dose projections with the DOSECALC Dose Projection Model.

1.2 DISCUSSION

NOTE

Dose projections are performed in the CR or TSC until the EOF is operational, then the projections are performed in the EOF. If the EOF cannot perform the projections, the projections may be performed in the TSC, Backup EOF, Clean Chemistry Lab, Admin Building Chemistry Area, or in the Control Room. (DOSECALC PDS workstations are available at each of these locations)

2.0 RESPONSIBILITIES

- 2.1 Emergency Director (ED)/Offsite Emergency Coordinator(OEC)- Is responsible for implementing this procedure.
- 2.2 Radiation Emergency Manager (REM) - Is responsible for Radiological Assessment, after the EOF is operational.
- 2.3 Radiation Protection Manager (RPM) - Is responsible for Radiological Assessment, after the TSC is operational.
- 2.4 Radiological Assessment Coordinator (RAC) - Coordinating Offsite Dose Calculations and Radiological data acquisition, in the EOF.
- 2.5 Radiological Assessment Dose Calculator - Perform offsite dose calculations using this procedure.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 3
--	-----------------	---------------	---------

3.0 REFERENCES

- 3.1 01-S-08-11, Radioactive Discharge Controls
- 3.2 06-CH-SG17-O-0045, Radwaste Release Post-Release Calculations
- 3.3 06-CH-SP41-O-0036, Standby Service Water Post-Release Calculations
- 3.4 08-S-04-218, Radiological Effluent Tracking and Dose Assessment User's Guide
- 3.5 08-S-04-220, Ventilation Exhaust Gaseous Monitoring Systems' Operation
- 3.6 10-S-01-1, Activation of the Emergency Plan
- 3.7 DOSECALC Users Manual
- 3.8 EPA 400, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
- 3.9 GGNS Emergency Plan
- 3.10 NRC Regulatory Issue Summary 2004-13: Consideration of Sheltering in Licensee's Range of Protective Action Recommendations
- 3.11 NRC Regulatory Issue Summary 2003-12: Clarification of NRC Guidance for Modifying Protective Actions
- 3.12 Offsite Dose Calculations Manual (ODCM)

4.0 ATTACHMENTS

- 4.1 Attachment I - DOSECALC Instructions and Information
- 4.2 Attachment II - SRAO Trigger Points
- 4.3 Attachment III - Met Instrument Determination
- 4.4 Attachment IV - Stability Class Determination
- 4.5 Attachment V - Wind Shift Examples
- 4.6 Attachment VI - Sectors To Include On Notification Form
- 4.7 Attachment VII - Release Characterization

5.0 DEFINITIONS

- 5.1 AXM - Eberline Accident Range Effluent Monitor
- 5.2 BOP - Balance of Plant Computer
- 5.3 ΔT - Delta temperature (use 33 ft and 162 ft MET tower temperature sensor data in F°)
- 5.4 DOSECALC - A computer based mathematical model that predicts radiation doses at fixed points based on static weather conditions.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 4
--	-----------------	---------------	---------

- 5.5 DOWNWIND - An area located beyond a fixed point in the same direction the wind is blowing. The area covers three sectors, the sector containing the plume centerline, and the two adjacent sectors. If the plume centerline is on a sector line, four sectors are used until the three-sector criteria can be identified.
- 5.6 EOF - Emergency Operations Facility
- 5.7 EPZ - Emergency Planning Zone
- 5.8 ERFIS - Emergency Response Facility Information System
- 5.9 GE - General Electric Normal Range Effluent Monitor
- 5.10 KI - Potassium Iodide
- 5.11 MET - Meteorological
- 5.12 PAG - Protective Action Guide (EPA-400 Table 2.1)
- 5.13 PAR - Protective Action Recommendation
- 5.14 PAR change - any PAR after the PAR associated with the General Emergency declaration that recommends an action be implemented for a population that is different from any previously recommended action.
- 5.15 PDS - Plant Display System Computer
- 5.16 Q - Source material release rate in Ci/sec
- 5.17 Radiological release - A radiological release for emergency response purposes is defined as ANY detectable discharge of radioactive material to the environment that is due to the classified event. The release characterization should be further defined when communicating to offsite agencies to characterize whether or not the release is below or above Technical Specification limits.
- 5.18 Release Duration - The amount of time you expect the release to continue from the time of projection. Release duration does not include time before the current projection since Protective Action Guides are based on projected dose that can be avoided.
- 5.18 REM - Radiation Emergency Manager
- 5.19 RPM - Radiation Protection Manager
- 5.20 $\sigma\theta$ - Standard deviation of wind direction in angular degrees
- 5.21 SB - Site Boundary - For emergency dose calculations, the site boundary is fixed at 696 meters (.43 miles) from the center of the reactor.
- 5.22 Short Duration - For GGNS Radiological Assessment purposes a release that is expected to last less than one-hour.
- 5.23 SPDS - Safety Parameter Display System
- 5.24 SPING - Eberline Normal Range Effluent Monitor

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 5
--	-----------------	---------------	---------

- 5.25 SRAO - State Radiological Assessment Officer
- 5.26 TSC - Technical Support Center
- 5.27 UFSAR - Updated Final Safety Analysis Report
- 5.28 USEPA - United States Environmental Protection Agency
- 5.29 X - Airborne activity concentration in Ci/m³ or μ Ci/cm³ or μ Ci/ml
- 5.30 X/Q - Atmospheric dispersion factor in sec/m³

6.0 DETAILS

6.1 Radiological Assessment Process

CAUTION

- THIS PROCEDURE MAKES THE ASSUMPTION THAT ALL CALCULATIONS ARE PERFORMED USING ACTUAL RADIOLOGICAL DATA.
- CONTINUOUS ASSESSMENT OF PLANT CONDITIONS SHALL BE PERFORMED TO ASCERTAIN IF A RELEASE IS IN PROGRESS.

NOTE

- DOSECALC decays all isotopes from time of shutdown to time of release, then decays the isotopes from time of release to time of arrival at the projection distances - SB, 2 miles, 5 miles, 10miles, 15miles, and 20 miles.
- DOSECALC assumes iodine removal of 99.825% for material released from a SGBT vent release or a field team reading that is a filter release.
- DOSECALC uses 696 meters (.43 miles) for the Site Boundary in all directions.
- If DOSECALC is not receiving data from the PDS computer, a DOSECALC Data Sheet (EPP 12-03) should be used for data collection to aid performing a dose calculation.
- Information required to complete EPP 12-03 may be obtained from PDS Workstations, Status Boards, Plant Staff or other sources as directed by the RPM/REM.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 6
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6.1 (Cont.)

NOTE

- Unless the release duration is known, 2 hours should be used as the default release duration when estimating the projected exposure. Although the use of a 2-hour release duration addresses only future or projected dose, integrated dose (dose already received plus dose projected) should be considered when making protective action recommendations. The addition of dose results at various times or the use of the "future dose" field of DOSECALC may be used to obtain these results. When using the "future dose" field of DOSECALC, care should be exhibited to ensure the release rates and meteorological conditions are representative of those conditions exhibited during the release duration period.
- Radiological Assessment Guides - RA-1 and RA-1B (EPP 12-02) are normally provided via color flow charts as an aid to follow this procedure. The procedure text takes precedence over the guides in all cases where inconsistencies in interpretations may arise.

USING the Radiological Assessment Flowchart RA-1 and RA-1B (EPP 12-02) as a guide, perform the following:

- 6.1.1 Determine the correct ISOTOPIC mixture.
- 6.1.2 Determine when (if) the Rx was (is) shutdown.
- 6.1.3 Get appropriate current MET DATA. (see section 6.3 for details)
- 6.1.4 Monitor Release Pathways as follows:

NOTE

If release is from an unmonitored pathway such as blowout panel, roof hatch etc. you should use field team data, if available.

- a. Using PDS data or Eberline data, monitor the following gaseous release pathways (check for flow and radiation levels):

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 7
--	-----------------	---------------	---------

6.1.4 (Cont.)

CAUTION

Do not select any effluent monitor that contains negative numbers. Negative numbers dilute the estimated release rate.

- (1) Containment Vent
 - (a) Determine which type of purge/vent is being used by asking Engineering or Operations. The only flow rate Dosecalc provides on the Process monitor screen is the normal high volume purge flow rate of 6600 cfm. This flow rate is only used for high volume purge.
 - (b) During normal operations there are two containment purge paths:
 - Low volume purge through the six inch line flow rate is 600 cfm.
 - High volume purge through the 20 inch line - flow rate is 6600 cfm (This is the default flow rate Dosecalc provides in the Process Monitor screen.)
 - (c) During emergency operations there are two containment vent paths that require you to calculate the flow rate using containment pressure and the area listed below:
 - Through the six inch line - area is 0.196 square feet.
 - Through the 20 inch line - area is 2.18 square feet.
- (2) Fuel Handling Area Vent
- (3) Turbine Building Vent
- (4) Radwaste Building Vent
- (5) Standby Gas Treatment A & B Vent
- (6) Any other release path such as major doors, holes, piping, roof hatches and blow out panels. (Ask an SRO or Engineer in the facility).

AND

b. Monitor radiation levels in containment.

- (1) Containment Data - ERFIS OP Guide or Control Room Display or Inplant teams.

AND IF CONDITIONS WARRANT

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 8
--	-----------------	---------------	---------

6.1.4 (Cont.)

- c. Monitor radiation levels within the Protected Area.
 - (1) Onsite or offsite monitoring teams. (Contact Control Room ED if TSC/EOF/OSC not operational, TSC-RPM or EOF-RAC if TSC/EOF/OSC are operational).
- d. Monitor radiation levels outside the Protected Area.
 - (1) Offsite monitoring team data. (Contact Control Room ED if TSC/EOF/OSC not operational, TSC-RPM or EOF-RAC if TSC/EOF/OSC are operational).

6.1.5 Determine the expected release duration (The amount of time you expect the release to continue from the time of projection). If unknown use 2 hours as the default.

6.1.6 Input the data into the DOSECALC program.

NOTE

If a gaseous/particulate radiological release is in progress, input the DATE/TIME OF RELEASE START. (DATE/TIME OF RELEASE is left blank for liquid releases)

6.1.7 Evaluate DOSECALC results

NOTE

Emergency Notification Form is Form EPP 06-01.

SRAO Phone Numbers are in the Emergency Telephone Book.

If the SRAO Trigger Point of gaseous radiological release is exceeded and DATE/TIME OF RELEASE START is not included, enter DATE/TIME OF RELEASE START and re-perform assessment.

- a. Refer to section 6.4 and Attachment VII of this procedure to determine if the release is above or below Technical Specifications.
- b. The TSC RPM or EOF REM will verbally contact the SRAO at least hourly to assure a common understanding and knowledge of radiological and plant conditions so that appropriate protective actions may be recommended and implemented.
- c. IF no SRAO Trigger Points (Attachment II) are met, THEN go to 6.1.8.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 9
--	-----------------	---------------	---------

6.1.7 (Cont.)

d. IF any SRAO Trigger Point (Attachment II) is met AND a new PAR or PAR change is not indicated as outlined in 6.2, THEN:

(1) Inform the Emergency Director/Offsite Emergency Coordinator,

and

(2) contact the SRAO sooner than hourly,

and

(3) include the SRAO Trigger Point information on the next Emergency Notification Form.

NOTE

PAR development based on plant parameters should not be delayed awaiting confirmatory field surveys.

e. IF any SRAO Trigger Point(s) (Attachment II) is met AND a new PAR or PAR change is indicated as outlined in 6.2, THEN:

(1) Inform the Emergency Director/Offsite Emergency Coordinator

(2) Develop the 10 mile EPZ PAR within 15 minutes of the data becoming available

(a) Consider recommending sheltering instead of evacuation if any of the following conditions exist:

- [1] If the release is a short duration release (one hour or less) with a dose projection of < 1 rem TEDE and < 5 rem CDE at the Site Boundary where evacuation may not be completed before the release is secured. The only short duration release at GGNS is a Containment Venting.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 10
--	-----------------	---------------	----------

6.1.7 (Cont.)

- [2] If there are known impediments to evacuation (road closures, bridges out, tornado etc.) that may cause evacuation to be dangerous or impossible for an area.

NOTE

Development of 10 mile EPZ PARs should not be delayed to develop the ad-hoc PAR for areas outside the 10 mile EPZ. Ad-hoc PARs may be included on the 10 mile EPZ Emergency Notification or may be issued subsequently.

- (3) Initiate an Emergency Notification Form to include the indicated Protective Action Recommendation for the 10 mile EPZ. Section 6.7 of this procedure contains instructions on Emergency Notification Form completion.
- and
- (4) If applicable, expeditiously develop the ad-hoc PAR for areas outside the 10 mile EPZ,
- and
- (5) If applicable, initiate an Emergency Notification Form to include the indicated Protective Action Recommendation for areas outside the 10 mile EPZ,
- and
- (6) Contact the SRAO within 30 minutes of issuing the PAR Notification to ensure mutual understanding of the basis for the PAR and ascertain status of the PAR implementation.

6.1.8 Go back to 6.1.1 and continue assessment.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 11
--	-----------------	---------------	----------

6.2 Protective Actions

6.2.1 Protective actions within the 10 mile EPZ shall be recommended as follows. Sheltering may be recommended instead of evacuation in accordance with section 6.1.7.e.(2) of this procedure:

Condition	Protective Action Recommendation
<p>General Emergency Declared</p>	<p align="center">(STANDARD PAR)</p> <p>EVACUATE: 2 Miles All Sectors</p> <p align="center"><u>and</u></p> <p>EVACUATE: 5 Miles in Downwind Sectors</p> <p align="center"><u>and</u></p> <p>SHELTER: Remainder of 10 Mile Emergency Planning Zone (EPZ) with the exception of areas previously evacuated.</p>
<p>General Emergency Declared</p> <p align="center"><u>and</u></p> <p>Dose Projection corresponds to</p> <p>5000 mRem Thyroid CDE at site boundary</p>	<p align="center">(KI PAR)</p> <p>Consider prophylactic use of Potassium Iodide in Accordance with State Plans</p>
<p>General Emergency Declared</p> <p align="center"><u>and</u></p> <p>Dose Projection or Field Measurement at \geq 5 miles corresponds to</p> <p>1000 mRem TEDE</p> <p align="center"><u>or</u></p> <p>5000 mRem Thyroid CDE</p>	<p align="center">(EXTENDED PAR)</p> <p>EVACUATE: 2 Miles All Sectors</p> <p align="center"><u>and</u></p> <p>EVACUATE: 10 Miles in Downwind Sectors</p> <p align="center"><u>and</u></p> <p>SHELTER: Remainder of 10 Mile Emergency Planning Zone (EPZ) with the exception of areas previously evacuated.</p>

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 12
--	-----------------	---------------	----------

6.2.1 (Cont.)

<p>Standard or Extended PAR Required</p> <p>And</p> <p>Containment vent of one hour or less with expected dose < 1000 mRem TEDE and < 5000 mRem CDE at SB and area cannot be evacuated before venting.</p>	<p style="text-align: center;"><u>SHELTER PAR</u></p> <p style="text-align: center;">Standard PAR - Shelter 5 mile EPZ.</p> <p style="text-align: center;">Extended PAR - Shelter 10 mile EPZ.</p>
<p>Standard or Extended PAR Required</p> <p>And</p> <p>Known conditions exist that make evacuation impossible or dangerous.</p>	<p style="text-align: center;"><u>SHELTER PAR</u></p> <p style="text-align: center;">Standard PAR - Shelter 5 mile EPZ.</p> <p style="text-align: center;">Extended PAR - Shelter 10 mile EPZ.</p>

6.2.2 Protective Action Recommendations for areas outside the 10 mile EPZ (Ad-hoc PARs):

- a. Predetermined Protective Action Recommendations for areas outside the 10-mile Emergency Planning Zone (EPZ) have not been established.
- b. IF dose projections or field measurements correspond to ≥ 1000 mRem TEDE or ≥ 5000 mRem Thyroid CDE at ≥ 10 miles, THEN ad-hoc Protective Action Recommendations for affected areas outside of the 10 mile EPZ shall be developed and recommended.
- c. Ad-hoc PARs will encompass at least the Extended PAR of 6.2.1.
 - (1) The Extended PAR portion of the ad-hoc PAR will be developed and communicated within the standard 15 minute criterias for PAR development and Emergency Notifications.
 - (2) PARs for areas outside of the 10 mile EPZ may be developed and communicated in conjunction with or after developing and communicating the Extended PAR for the 10 mile EPZ.
 - (3) Ad-hoc PARs should be developed expeditiously, however the 15 minute criteria does not apply to developing PARs for areas outside the 10 mile EPZ.
- d. Ad-hoc PARs extend to appropriate distances outside the 10 mile EPZ and encompass appropriate areas as determined by the Lead Radiological Assessment staff.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 13
--	-----------------	---------------	----------

6.2.2 (Cont.)

- e. Dose assessment software may provide technical grounds for development of ad-hoc PARs.
- f. State agency representatives in the EOF should be consulted for development of the ad-hoc PARs at the discretion of the Lead Radiological Assessment staff.

6.2.3 Revising Protective Action Recommendations

- a. Dose projections are to be reviewed frequently and updated based on changing conditions such as:
 - (1) Site meteorological parameters and stability class
 - (2) Source terms
 - (3) Radiological field monitoring team data
 - (4) Expected Release Duration

6.2.4 Indicated PARs, Sectors, and Distances.

NOTE

Sheltering may be recommended instead of evacuation in accordance with section 6.2.1) of this procedure.

- a. The Extended PAR of 6.2.1 are indicated AND the ad-hoc PARs of 6.2.2 are indicated IF:
 - (1) dose projections correspond to ≥ 1000 mRem TEDE at ≥ 10 miles,
OR
 - (2) field measurements correspond to ≥ 1000 mRem TEDE at ≥ 10 miles,
OR
 - (3) dose projections correspond to ≥ 5000 mRem CDE Thyroid at ≥ 10 miles,
OR
 - (4) field measurements correspond to ≥ 5000 mRem CDE Thyroid at ≥ 10 miles
- b. The Extended PAR of 6.2.1 is indicated IF:
 - (1) 6.2.4.a above does NOT apply,

AND

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 14
--	-----------------	---------------	----------

6.2.4 (Cont.)

(2) dose projections correspond to ≥ 1000 mRem TEDE at ≥ 5 miles,

OR

(3) field measurements correspond to ≥ 1000 mRem TEDE at ≥ 5 miles,

OR

(4) dose projections correspond to ≥ 5000 mRem CDE Thyroid at ≥ 5 miles,

OR

(5) field measurements correspond to ≥ 5000 mRem CDE Thyroid at ≥ 5 miles

c. The Standard PAR of 6.2.1 is indicated IF :

(1) 6.2.4.b above does NOT apply,

AND

(2) dose projections correspond to > 1000 mRem TEDE at the Site Boundary (696 meters),

OR

(3) field measurements correspond to > 1000 mRem TEDE at the Site Boundary (696 meters),

OR

(4) dose projections correspond to > 5000 mRem CDE Thyroid at the Site Boundary (696 meters),

OR

(5) field measurements correspond to > 5000 mRem CDE Thyroid at the Site Boundary (696 meters)

d. The KI PAR of 6.2.1 is indicated if dose projections correspond to ≥ 5000 mRem CDE Thyroid at the Site Boundary (696 meters)

e. The KI PAR if indicated, is recommended in addition to Standard, Extended, or ad-hoc PAR.

f. IF a previous PAR recommended evacuating a Sector to a prescribed distance, THEN subsequent PARs do not recommend lesser evacuation distances for the Sector indicated in the previous PAR.

g. IF the PAR indicated in 6.2.4.a-e above has previously been issued for the Sectors under consideration, THEN a PAR change is not indicated.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 15
--	-----------------	---------------	----------

6.2.4 (Cont.)

h. Indicated PARs should include only:

(1) currently affected sectors,

AND

(2) any sectors the plume has affected since the last Emergency Notification but for which the indicated PAR has not previously been issued

NOTE

When completing the Emergency Notification Form, each form should represent the current and/or projected radiological, meteorological and plant conditions.

During periods of rapid changes in wind direction, as might be experienced along the leading edge of a weather front, it is important to capture all sectors through which the wind has passed.

In such instances, Section 5. (Recommended Protective Actions) of the Emergency Notification Form should include 6.2.4.h(1) and 6.2.4.h(2) above.

- see Attachments V & VI for examples

Section 8.B. (Meteorological Data - Sectors Affected) is normally used to annotate only those sectors affected by the current wind direction.

Section 6 (Comments) of the Emergency Notification form may be used to explain the reason for the additional sectors or to explain the additional affected sectors if protective action recommendations have not been made.

6.2.5 The RPM/REM must report the results of dose calculations/rad assessment immediately to the Emergency Director/Offsite Emergency Coordinator.

6.3 Meteorological Data

6.3.1 DOSECALC automatically determines appropriate MET DATA based on available instruments and parameters as outlined in Attachment III.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 16
--	-----------------	---------------	----------

6.3.2 The parameter used to calculate Stability Class (Delta-T or Sigma-Theta) and its instrument computer point are indicated in the MET DATA area. The parameter not used for Stability Class displays a question mark (?). In the event both parameters are unavailable (as indicated by question marks in both Delta-T and Sigma-Theta) use Attachment IV to determine Stability Class.

6.4 Determining if a Release is in Progress

6.4.1 ANY detectable discharge of radioactive material to the environment that is due to the classified event is considered to be a release. Attachment VII may be used to help determine if a release is in progress.

- a. If there is no release in progress check box 9.A. on the Emergency Notification Form.
- b. If the release has occurred but stopped and is no longer in progress, check box 9.D. and complete line 9.E. on the Emergency Notification Form.
- c. If there is a release in progress proceed to step 6.4.2 below.

6.4.2 Determine if the release is above or below Technical Specification gaseous effluents Limits listed in Reference 3.12 and check boxes 9.B or 9.C, and complete line 9.E, on the Emergency Notification Form. Attachment VII may be used to help determine if a release is above Technical Specification limits:

- a. **Monitored release:** Check PDS Data Point D173000 to determine if the release is above or below Technical Specifications.
- b. **Unmonitored release:** Any field reading above normal outside the Site Boundary is considered an indication that the release is above Tech Spec Limits.

6.5 Liquid Releases

6.5.1 If a liquid release exceeds EAL AU1, AA1, AS1 or AG1 of 10-S-01-1, the radiological information from the RETDAS printout or hand calculation is included in Section 6 of the Emergency Notification Form (Incident Description, Update, Comments).

NOTE

Prior to the declaration of the Emergency, the information that resulted in the declaration is normally supplied by Chemistry to the Shift Manager.

6.5.2 Section 11 and 12 of the Emergency Notification Form are left blank, as they relate to gaseous effluents and do not apply to liquid releases.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 17
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- 6.5.3 To print an Emergency Notification Form, leave the DATE/TIME OF RELEASE field in Dosecalc blank. This leaves Sections 9, 10, 11 and 12 of the Emergency Notification Form blank when printing from Dosecalc.
- 6.5.4 Complete Sections 9 and 10 manually.
- 6.6 Securing from a Release
- 6.6.1 After a release is secured, delete the entries in the DATE/TIME OF RELEASE field.
- 6.6.2 Re-perform calculations.
- 6.6.3 Print Emergency Notification Form.
- 6.6.4 Complete Section 9 manually.
- 6.6.5 Leave Sections 10, 11, and 12 blank.
- 6.7 Completing the Notification Form
- 6.7.1 Sections 5, 7-12 are completed by the On-shift Chemist (CR), RPM (TSC) or the REM (EOF) as appropriate.
- 6.7.2 Sections are completed as follows:
- a. Section 5 (Recommended Protective Actions). Refer to section 6.2 to determine what protective actions to recommend.
 - b. Section 7 (Reactor Shutdown). The DOSECALC Computer normally updates the RX SHUTDOWN and DATE/TIME field automatically for all conditions except during an ATWS. During an ATWS, a manual entry or deletion of RX Status and shutdown times may be required. Concurrence of the shutdown reactor following an ATWS Condition normally comes from the Emergency Director or Shift Supervisor.
 - c. Section 8 (Meteorological Data). The DOSECALC computer normally completes the MET data section of the notification form with the exception of line D; Precipitation, which must be completed manually.
 - d. Section 9 (Release Information). Refer to section 6.4 of this procedure to determine if there is a release and whether or not it is above Technical Specifications.
 - e. Line 9E. If line 9B, C or D is checked, complete line 9E.
 - (1) Enter release start time.
 - (2) If release has ended enter the release end time and release duration, the actual duration of the release, and circle 'Actual'.
 - (3) If the release is ongoing enter the expected duration from the time of projection forward (if unknown use two hours) and circle 'Expected'.

Title: Radiological Assessment and Protective Action Recommendations	No.: 10-S-01-12	Revision: 039	Page: 18
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6.7.2 (Cont.)

- f. Section 10 (Type of release). Section 11 (Release Rate) and Section 12 (Estimate of projected off-site dose) are normally filled in by the DOSECALC computer.

6.8 Records and Information

- 6.8.1 Forms and paperwork generated by this procedure during emergencies are to be retained for information and event reconstruction and submitted to the Manager, Emergency Preparedness to be filed as a Quality Assurance record.

10-S-01-12	Revision: 039
Attachment I	Page 1 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

In this Instruction Manual, the term "screen" is meant to convey the window that fills the monitor. The Term "functional area" or "area" is meant to convey an area on a window dedicated to be a specific type of data (e.g. "RELEASE DATA").

1.0 **STARTUP**

When the User approaches the workstation, the screen may be dark due to the screen saver feature.

- a. Click anywhere on the screen to bring up the login screen.
- b. Enter the login and password displayed on the front of the workstation.

NOTE

Allow 2-3 minutes for PDS to load. PDS is required to be displayed for the workstation to receive plant data.

- c. After PDS menu is displayed, click in the black screen to access the Root menu.
- d. On the Root menu, scroll down to DOSECALC to bring up the Dose Calculation program. The Main Screen on the DOSECALC program appears.

2.0 **MAIN SCREEN**

The Main screen contains the DOSECALC Data windows. This is the beginning point of DOSECALC and the program returns to this screen after data is entered on data screens. If a data screen is on the monitor, click on the DONE button and it returns to the MAIN screen.

DOSECALC requires specific information to perform a dose calculation. The information is as follows: Wind Speed, Accident Type, Source Term, and when performing a dose calculation based on a field monitoring team reading, Distance and Angle. Written warnings delineating each of the above requirements are at the bottom of the screen. They disappear as each of the required data is entered.

User definable fields have a White background and are for data entry. In user definable fields, the text is either Red or Black. Red text indicates that the user has entered/modified the value displayed. Black text indicates that the program supplies the value displayed. Yellow fields are not user definable and display information for the User's benefit. All text displayed in Yellow fields is Black.

2.1 **ACCIDENT DATA AREA**

This area is in the upper left-hand corner of the MAIN screen. A HELP button is available to the User for an explanation of the area. Click on ISOTOPIC MIX to select the Isotopic Mix desired.

10-S-01-12	Revision: 039
Attachment I	Page 2 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

2.1 **ACCIDENT DATA AREA** (Cont.)

NOTE

The isotopic mixture defaults to steam cycle mixture.

A window with isotopic fractions comes up and the User is required to select one prior to performing a projection. Determining the appropriate mix may require input from Operations personnel.

For entry of an effluent spectrum (e.g. from an effluent sample) choose the USER DEFINED accident type and a window appears for entry of data. The entered spectrum is used in the conversion of effluent monitor readings to release rates.

Click on the RX SHUTDOWN DATE/TIME field and enter the date in the following format: mm/dd/yy. Enter the time in the following format: hh:mm. The DOSECALC Computer normally updates the RX SHUTDOWN and DATE/TIME field automatically for all conditions except during an ATWS. During an ATWS, a manual entry or deletion of RX Status and shutdown times may be required. Concurrence of the shutdown reactor following an ATWS Condition normally comes from the Emergency Director or Shift Supervisor. When this is done, move to the MET DATA area.

NOTE

When deleting DATE/TIME OF SHUTDOWN data, ensure all characters are deleted (including spaces). Failure to delete all characters results in the ENF "RELEASE IS OCCURRING" checkbox to be checked and ENF Section 12 dose fields to be completed.

RX SHUTDOWN DATE/TIME are automatic inputs from PDS. PDS uses an algorithm to determine if the reactor is shutdown. If the MODE SWITCH is in SHUTDOWN and reactor power is <4%, PDS determines that the reactor is shutdown. The time of shutdown may be different than determined by PDS, especially during an ATWS. The Emergency Director/Offsite Emergency Coordinator may direct that times other than the PDS shutdown time be used. In all cases, the time of shutdown determined by the ED/OEC should be used.

10-S-01-12	Revision: 039
Attachment I	Page 3 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

2.2 MET DATA AREA

A HELP button is available to the User for an explanation of the area. The area is set to default to the Primary Met tower 10 meter instrumentation. In the event this instrumentation is unavailable, DOSECALC automatically selects appropriate instrumentation based on the flowchart in Attachment III. The HELP screens and Attachment IV outline the backup method for stability class determination if the MET towers are unavailable.

The HELP button lists the ERFIS computer points for obtaining MET data in the event PDS is not automatically updating DOSECALC.

To enter Met data, click on the fields for wind speed and wind direction. DOSECALC selects a stability class based on this data. Alternately, a stability class may also be entered manually. However, if the entered stability class differs from the calculated stability class, a warning comes up on the area notifying the User of the conflict.

NOTE

When performing a dose calculation, if there is a change in wind speed, direction, or stability class, an alarm sounds. To acknowledge alarm, click on silence. To remove alarm box from screen, press OK.

After using User Defined data, a return to PDS data can be performed by clicking on the PDS Data button in the Process Monitor Data area. This returns both Process Monitor Data and Met Data to PDS.

After completing this area, move the cursor to the RELEASE DATA area.

10-S-01-12	Revision: 039
Attachment I	Page 4 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

2.3 RELEASE DATA/MONITOR DATA SCREEN OR WINDOWS

A HELP button is available for the User for an explanation of the area. The release duration field defaults to two hours but may be changed by the User by clicking on the field. The User may select Release to present, future release, or user defined for release duration. If RLS TO PRESENT is selected, the program automatically calculates the Release to present based upon release start time. The User is required to enter numbers for the Future Release and the User Defined.

To select the effluent monitoring data for the release, click on the appropriate button. When the user presses the title button for an area, it turns blue to indicate the values and User selections in that area are to be used during projection calculations.

2.3.1 PROCESS MONITOR DATA AREA

This area offers selection of the GGNS effluent monitors as follows:

GE MON-LR
SPING-LR CH5
SPING-MR CH7
AXM-HR CH3
AXM-MR CH4

These monitors apply for the GGNS release points which are as follows:

CNTMT VENT
TURB BLDG VENT
FUEL HNDLG VENT
RW BLDG VENT
STAND BY GAS A (except GE MON)
STAND BY GAS B (except GE MON)

The Help screen for this window has the complete list of ERFIS computer points of each of these monitor/release points.

The Flow Rate field for each release point may have either the default or PDS value set in the field, but this may be changed by User override.

10-S-01-12	Revision: 039
Attachment I	Page 5 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

2.3.1 PROCESS MONITOR DATA AREA (Cont.)

Click on the appropriate monitor button and it changes to red to indicate that the monitor is selected. Click on the field and enter a monitor reading, if necessary. Multiple release points may be selected, but multiple monitors on the same release point may not be selected. Click on the desired release point and the button turns red to indicate it has been selected.

Use of SGBT A or SGBT B monitor release point indicates that SGBT is operational/functional and that the effluent is filtered at 99.825% efficiency for Iodines.

Once these selections are made, click on DONE.

A trend of a selected channel may be reviewed by double-clicking on the right mouse button of the selected channel.

NOTE

Containment monitors can also be used if process monitors are offscale or inoperable.

After using User Defined data, a return to PDS data can be performed by clicking on the PDS Data button. This returns both Process Monitor Data and Met Data to PDS.

2.3.2 CONTAINMENT DATA AREA

A dose projection may be performed using the Containment Area Monitors. A HELP screen is available to the User. Click on the monitor to be used and then click on the field and enter the monitor reading. Design leakage (9.1 cfm) is default entered in the CTMT LEAK RATE field. The User may select a leak rate by clicking on the Leak Rate Button. To calculate a leakage rate, the User is required to enter area and pressure for the release point. A YES or NO answer is required to be selected for MIX FILTERED (default is YES). A "YES" reduces the iodine fraction by 99.825%. Once those selections are made, click on Done.

- a. You must determine which type of purge/vent is being used by asking Engineering or Operations. The only flow rate Dosecalc provides on the Process monitor screen is the normal high volume purge flow rate of 6600 cfm. This flow rate is only used for high volume purge.
- b. If containment purge is on use the following flow rates:
 - Low volume purge (6 inch line) use 600 cfm.
 - High volume purge (20 inch line) use 6600 cfm
- c. If the containment is being vented you must calculate the flow rate using the containment pressure (available from the Shift Manager, TSC Coordinator or the OEC Technical Assistant) and the vent area below:
 - 6 inch vent line use 0.196 square feet
 - 20 inch vent line use 2.18 square feet.

10-S-01-12	Revision: 039
Attachment I	Page 6 of 7

DOSECALC INSTRUCTIONS AND INFORMATION**2.3.3 FIELD DATA AREA**

- a. This area is used for dose projections based on field monitoring team data. A HELP screen is available to the Users.
- b. Click on the white FIELD DATA button in the RELEASE DATA area.
- c. Click on FIELD MAP button.
- d. After clicking the FIELD MAP button, an EPZ map appears. Use the scroll bars to move to location of sample. Click on the sample location with the left mouse button. A sample data box appears. The location of the sample is automatically entered.
- e. A YES or NO answer is required to be selected for MIX FILTERED (default is YES). A "YES" reduces the iodine fraction by 99.825%.

NOTE

"YES" is selected if the release point is through Standby Gas Treatment. If the release is from a release point other than Standby Gas Treatment, "NO" is selected.
"YES"

- f. Click on the method to be used. If AIR SAMPLE RESULT is chosen by clicking on the button, the User may enter the results of a spectral analysis of a field monitoring team sample. Click twice on the AIR SAMPLE RESULT field and a screen for the air sample results in $\mu\text{Ci}/\text{cc}$ appears. Alternately, a gross $\mu\text{Ci}/\text{cc}$ may entered.

NOTE

If gross $\mu\text{Ci}/\text{cc}$ AIR SAMPLE RESULT is used, only the Iodine charcoal cartridge results are included.

- g. After entering results, click OK. The sample results are displayed on the map in a red box.
- h. Click on the right mouse button anywhere in the map to return to main screen.
- i. Click on the FIELD DATA button to highlight the box (the box turns blue). Click on DONE when complete.

10-S-01-12	Revision: 039
Attachment I	Page 7 of 7

DOSECALC INSTRUCTIONS AND INFORMATION

2.4 **RELEASE DATA AREA (Additional Features)**

An option to use the results of an effluent sample is also provided in this area. Click on the NUCLIDE MIX DATA field and a window appears for entry of the spectral data. A help screen is available in this window. Click on DONE when completed.

The "TIME TO NEXT DOSE CALCULATION" feature is displayed in this area. Dose calculations are performed every 60 seconds unless the User clicks on HOLD to delay the next dose calculation or on IMMEDIATE to begin the next dose calculation.

2.5 **DOSE DATA, PLUME DATA, AND PATHWAY DATA AREA**

These areas provide the results of the DOSECALC calculation. There is no interaction with the User (the fields are yellow).

Doses are provided in terms of total projected dose from the time of the current projection through the estimated release duration.

NOTE

When dose calculations are performed, if projections exceed SRAO trigger points or GE limits, an alarm sounds. To acknowledge alarm, click on silence. To remove alarm box from screen, click on OK.

2.6 **PRINT/PREVIEW**

Click on the Preview ENF button, to preview the Emergency Notification Form. The following data is automatically entered:

DATE/TIME
REACTOR SHUTDOWN DATE/TIME
MET DATA (except for precipitation)
RELEASE INFORMATION

After the form has been reviewed, click on print in the menu bar. To exit ENF Preview, click on EXIT in the menu bar. To print the dose calculation data, click on the PRINT DATA button. The ENF and the raw data have corresponding serial numbers in the upper right corner of printouts.

NOTE

The automatic calculation freezes during the ENF preview. To resume calculations, press the RESUME button.

Failure to resume calculations may cause PAR or EAL changes to be missed.

To recall ENF or data sheets, click on the RECALL DATA button. The last ten calculations are stored. Click on the appropriate data to retrieve.

10-S-01-12	Revision: 039
Attachment II	Page 1 of 1

SRAO TRIGGER POINTS

RPM/REM shall notify the State Radiological Assessment Officer (SRAO) when any of the following occurs:

- Plant conditions exists that indicate possible, potential, or actual Gaseous Radiological release from GGNS.
- Change in wind direction that would shift projected plume centerline into another sector
- Change of ± 5 mph in wind speed
- Any change of stability class
- Any change in emergency classification
- Change (increase or decrease) of source term/radiological release rate that would result in the following projected doses at the Site Boundary (696 m):

TEDE	CDE Thyroid
1000 mRem	5000 mRem
2000 mRem	10000 mRem
3000 mRem	15000 mRem
4000 mRem	20000 mRem
5000 mRem	25000 mRem

above these levels, change of $\pm 20\%$

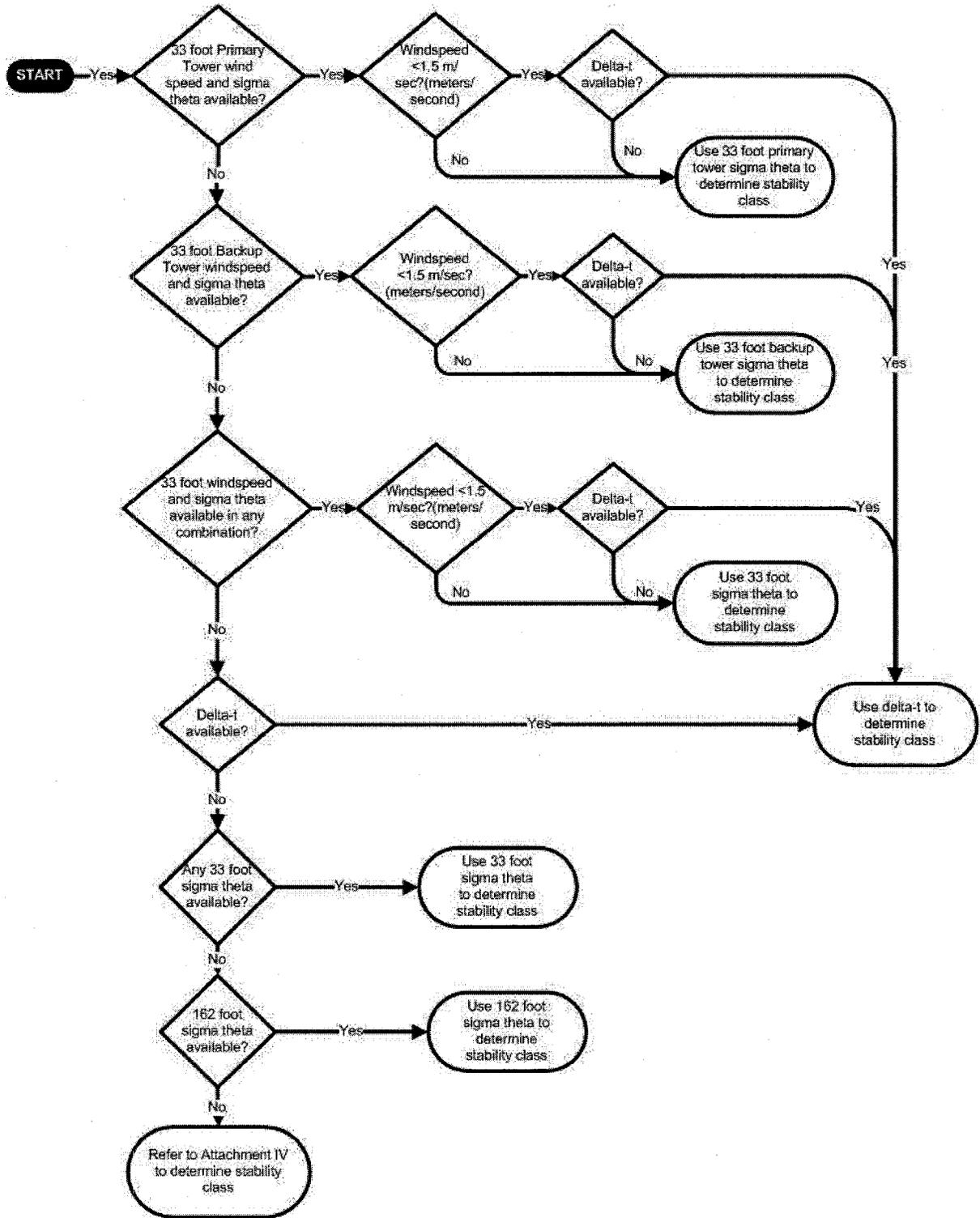
SRAO telephone numbers are in the EMERGENCY TELEPHONE BOOK

Courtesy SRAO notifications (Not Trigger Points)

- notification that the TSC/EOF is operable
- final notification that the TSC/EOF is deactivated

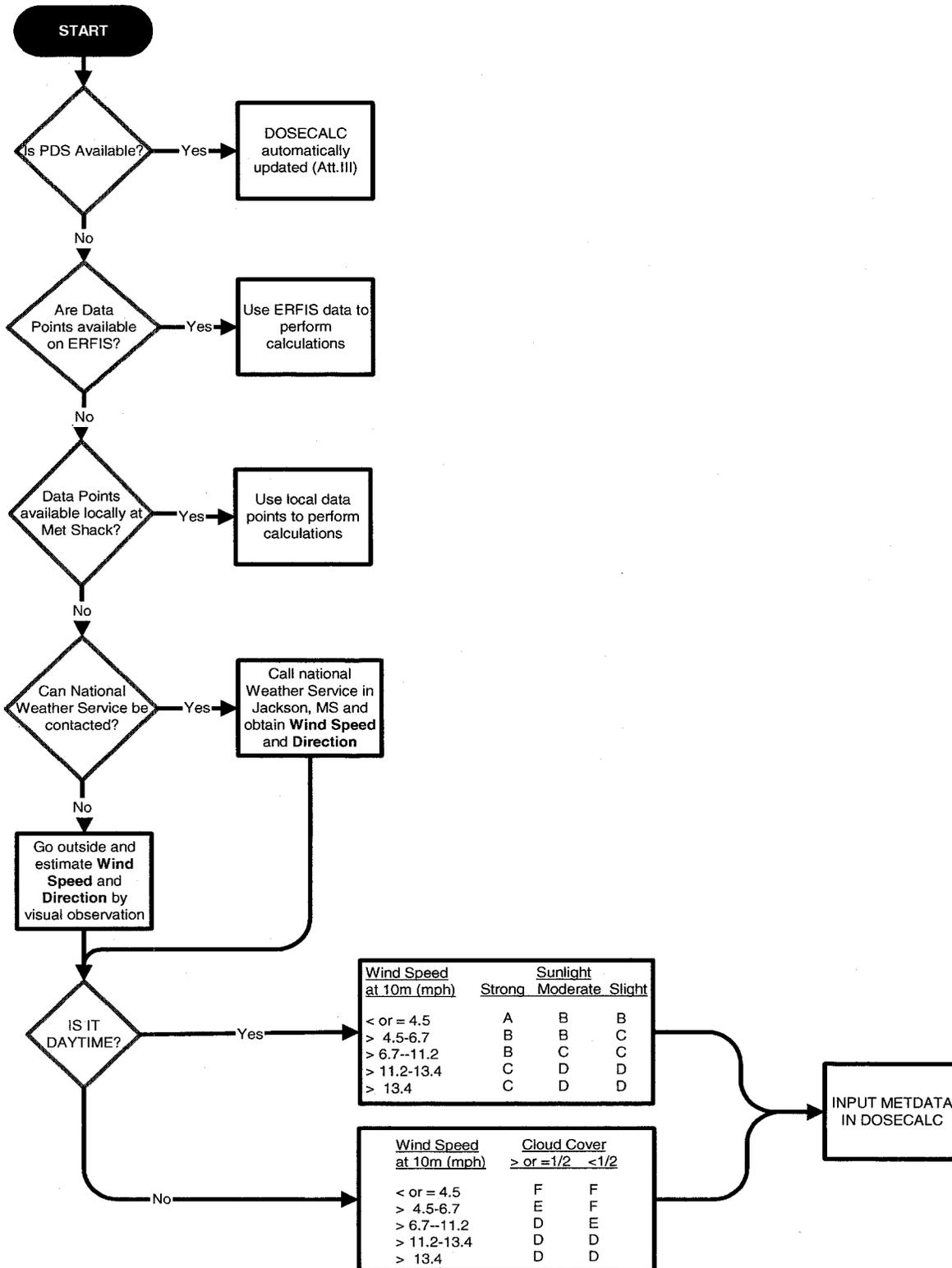
10-S-01-12	Revision: 039
Attachment III	Page 1 of 1

MET INSTRUMENT DETERMINATION



10-S-01-12	Revision: 039
Attachment IV	Page 1 of 1

STABILITY CLASS DETERMINATION



10-S-01-12	Revision: 039
Attachment V	Page 1 of 3

WIND SHIFT EXAMPLES

NOTE- Examples assume that ad-hoc PARs greater than 10 miles are not indicated and dose calculations are constant.

EXAMPLE 1:

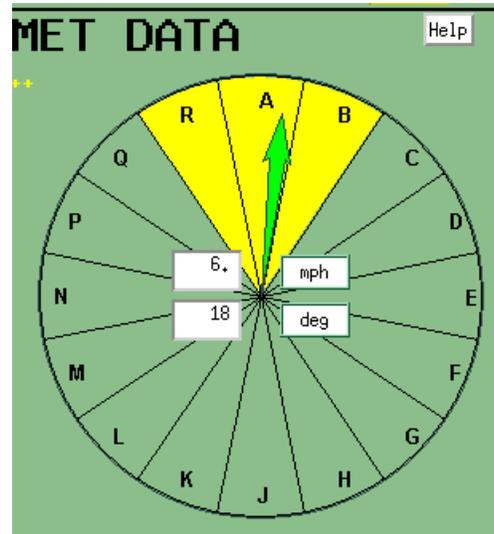
A General Emergency has just been declared and you are preparing the initial ENF for the GE (i.e.-no ENFs previously issued containing PARs). Wind affects only the current sectors (R,A,B).

Actions:

- Notify ED/OEC.
- Develop new PAR within 15 minutes.
- Issue new ENF within 15 minutes of developing new PAR.
- Notify SRAO of Trigger Point.

Section 5b PAR Sectors:

Those sectors currently affected (R,A,B).



EXAMPLE 2:

Previous ENF issued with Sectors R,A,B listed in Section 5b.

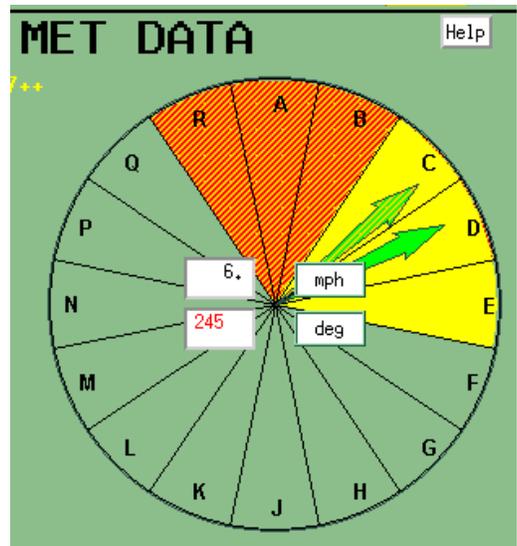
Wind now shifts to affect Sectors C,D,E.

Actions:

- Notify ED/OEC.
- Develop new PAR within 15 minutes.
- Issue new ENF within 15 minutes of developing new PAR.
- Notify SRAO of Trigger Point.

Section 5b PAR Sectors:

R,A,B previously identified, so only those sectors currently affected (C,D,E).



10-S-01-12	Revision: 039
Attachment V	Page 2 of 3

WIND SHIFT EXAMPLES

EXAMPLE 3:

Previous ENFs issued identifying R,A,B,C,D, & E listed in Section 5b.

Wind now rapidly shifts to affect Sectors G,H,J.

Actions:

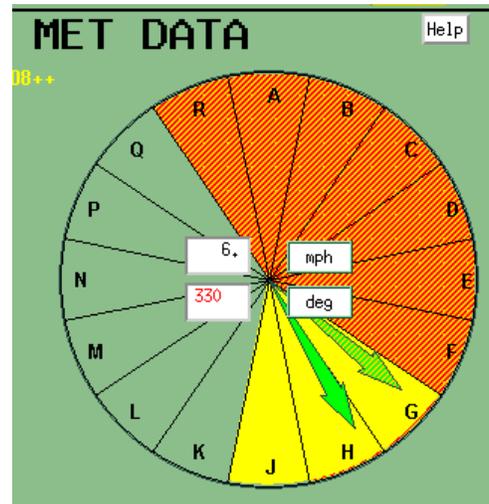
- Notify ED/OEC.
- Develop new PAR within 15 minutes.
- Issue new ENF within 15 minutes of developing new PAR.
- Notify SRAO of Trigger Point.

Section 5b PAR Sectors:

R,A,B,C,D, & E previously listed, but F was not.

Section 5b should contain those currently affected (G,H,J) **AND** those sectors NOT previously identified (Sector F).

5b should contain F,G,H,J.



EXAMPLE 4:

Previous ENFs issued identifying R,A,B,C,D,E,F,G,H,J listed in Section 5b.

Wind now shifts back to affect A,B,C.

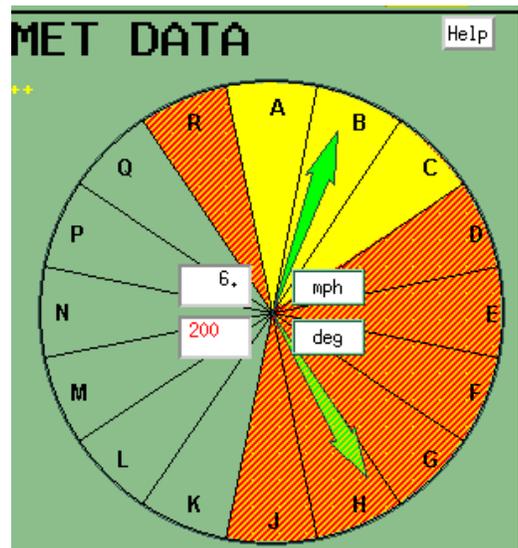
Actions:

- Notify ED/OEC.
- Notify SRAO of Trigger Point.
- New PAR not required (by definition it is not a PAR change). Include sectors on next periodic update.

Section 5b PAR Sectors:

R,A,B,C,D,E,F,G,H,J previously listed.

Section 5b should contain only those currently affected (A,B,C).



10-S-01-12	Revision: 039
Attachment V	Page 3 of 3

WIND SHIFT EXAMPLES

EXAMPLE 5:

Previous ENFs issued identifying R,A,B,C,D,E,F,G,H,J listed in Section 5b.

Wind now shifts to the boundary line affecting A,B,C,D.

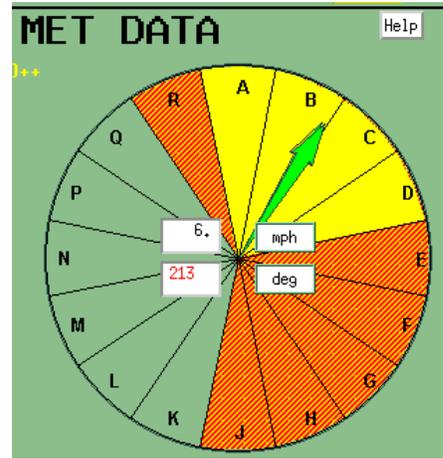
Actions:

- Notify ED/OEC.
- Notify SRAO of Trigger Point.
- New PAR not required (by definition it is not a PAR change). Include sectors on next periodic update.

Section 5b PAR Sectors:

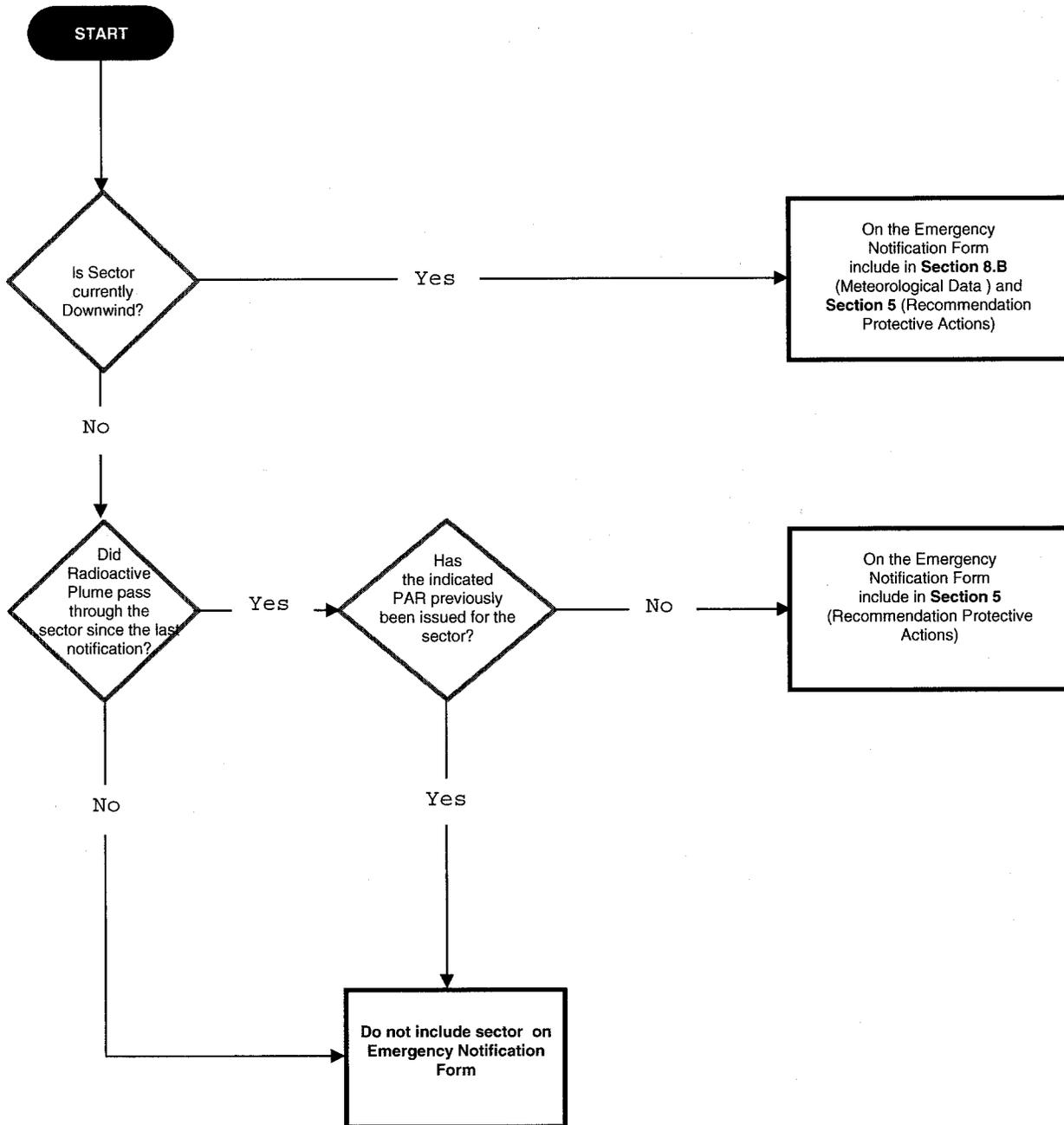
R,A,B,C,D,E,F,G,H,J previously listed.

Section 5b should contain only those currently affected (A,B,C,D).



10-S-01-12	Revision: 039
Attachment VI	Page 1 of 1

SECTORS TO INCLUDE ON NOTIFICATION FORM



10-S-01-12	Revision: 039
Attachment VII	Page 1 of 1

Release Characterization

