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May 7, 2001

U. S. Nuclear Regulatory Commission
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NOG- 01170

VOGTLE ELECTRIC GENERATING PLANT
EMERGENCY PLAN IMPLEMENTING PROCEDURE REVISION

Gentlemen:

In accordance with 10 CFR 50.4, as required by 10 CFR 50, Appendix E, Part V, Southern Nuclear hereby submits the following revision(s) to the Vogtle Emergency Plan Implementing Procedure(s):

Procedure	Revision	Effective Date
91304-C	13	04/02/01

By copy of this letter, the NRC Region II Administrator and the Site NRC Senior Resident Inspector will receive one copy each of the revision(s).

Please contact Angel Cardona at (706) 826-3114 if you have questions.

Sincerely,

Jeffrey T. Gasser
General Manager

JTG:AEC:rpb

Enclosure: Emergency Plan Implementing Procedure(s)

A045

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are being submitted to you for storage. Documents (Part B) are indicated by a mark in the SE column.

Document Number	Rev	SE	Document Description
91304-C	13		"Estimating Offsite Dose"
			(5 pages of documentation)

RECEIVED
APR 2 2001

Remarks: Printed copy verified in document control.

Robert J. Anderson
Submitted By:

Emergency Preparedness
Department

04/02/2001
Date

Received By: (Document Control)

4/2/01
Date

Figure 2 (Example)

REFERENCE USE PROCEDURE **PRB REVIEW REQUIRED**

1.0 PURPOSE

The purpose of this procedure is to provide instructions for estimating offsite doses.

2.0 RESPONSIBILITIES

2.1 The Emergency Director shall initially be responsible to ensure that offsite dose calculations are performed.

2.2 The Health Physics/Chemistry (HP/Chem) Shared Foreman is the designated on-shift dose analyst.

2.3 The HP Supervisor shall assume the responsibility for determining release rates and performing offsite dose calculations from the time the Technical Support Center (TSC) is activated until the Emergency Operations Facility (EOF) Dose Assessment is activated.

2.4 The Dose Assessment Manager shall assume the responsibility for offsite dose calculations from the time the EOF Dose Assessment is activated until the need for dose assessment is no longer required.

3.0 PREREQUISITES

3.1 An actual release of airborne radioactive material has occurred or a projected release has become a possibility because of an emergency condition.

4.0 PRECAUTIONS

4.1 Iodine release rate factors of this procedure were developed based on engineering assumptions. Whenever available, sampling, survey and/or fixed iodine cartridge evaluation results should be utilized to refine these values or as a direct input for iodine release rate(s).

4.2 The accuracy and representatives of the radiological and meteorological data and the accuracy of atmospheric dispersion calculations are such that no more than two significant figures should be used in the final results.

4.3 The dose rates estimated using this procedure are based on conservative meteorological and radiological assumptions and may result in an overestimation of the actual offsite dose rates. Verification by field monitoring teams should be obtained as soon as practicable.

5.0 PROCEDURE

5.1 COMPUTER DOSE CALCULATIONS

5.1.1 The Dose Assessment Manager shall assign an individual to collect and record meteorological and radiological data at approximate 30-minute intervals using Data Sheet 1.

NOTE

a. A radiological release is defined as a radioactive release to the environment, detected by effluent monitors or environmental monitoring, above normal levels that is attributable to a declared event. Normal levels are the highest reading in the last 24 hours prior to the emergency, excluding the current peak value for effluent monitors.

b. In addition, the Emergency Director has the discretion to declare that a radiological release is occurring based on plant conditions that would indicate that a release is in progress.

5.1.1.1 The Dose Assessment Manager shall assign a dose analyst to perform the computer dose calculations using the Dose Assessment Checklist in this procedure. The initial dose projections should be made within 15 minutes of the radiological release. Dose Projection Calculations subsequent to initial calculation shall be performed at least every 30 minutes if input data is changing (i.e., meteorological, or source term).

5.1.2 The individual assigned to collect and record meteorological and radiological data shall:

5.1.2.1 Obtain meteorological data (Wind Direction from - to, Wind Speed, Stability Class and Precipitation) from one of the following sources in the priority given below. Obtain 15-minute averages for meteorological parameters.

Sources of Meteorological Data:

a. Integrated Plant Computer (IPC)

(1) Primary Met Tower 10 Meters

(2) Secondary Met Tower 10 Meters

b. Send individual to meteorological towers to call back data.

c. Savannah River Site Emergency Operations Center (number may be obtained from VEGP Emergency Response Telephone Directory)

d. National Weather Service (NWS) (Columbia, S.C.) - wind speed and wind direction (NWS number may be obtained from VEGP Emergency Response Telephone Directory).

NOTE

Obtain HP Supervisor or Dose Assessment Manager approval prior to using defaults.

e. Default meteorology: wind speed = 5.4 mph
wind direction = no predominant direction
stability class = E

f. Use Sigma Theta Table, Table 1 to obtain stability class if the computed stability class and delta Temperature data are not available.

5.1.2.2 Obtain weather forecast information from National Weather Service in Columbia, S.C. by commercial telephone.

5.1.2.3 In the event that significant wind speed or stability class changes are expected, perform dose assessment calculation utilizing both current and forecast parameters.

5.1.2.4 Obtain radiological and effluent release data from one of the following sources in the priority given below.

NOTE

Plant Vent Flow Transmitter FT-12835 (Point ID F5106) is seismically qualified and can be used as an alternate for the Plant Vent Source Term Flow Rate during the occurrence of a seismic event. There are no remote indications for FT-12835 and can only be obtained via the Integrated Plant Computer.

Sources of Radiological and effluent release rate data:

a. IPC

b. PDC (PERMS Display Console)

c. Safety Related Display Cabinet (Status Loop Communicator in the Control Room)

d. Data Processing Module (PERMS)

e. Direct measurement of effluent path with a portable instrument.

f. Default values in COMPUTER CODE.

5.1.2.5 Obtain effluent flow rates from the IPC or default flow rates from the following table if the IPC is not available:

RELEASE POINT	DEFAULT FLOW RATE (CFM)	
Turbine Building Steam Jet Air Ejector	9.0 E+2	
Main Steam Code Safety Valve	5.4 E+3 per valve	
Main Steam Atmospheric Relief Valve (ARV)	3.9E+3	
Turbine Driven Aux Feed Water Pump	3.0E+4	
Containment Leakage	3.8	
Plant Vent Stack to Atmosphere	**Unit 1**	**Unit 2**
Normal Flow	1.4E+5	9.5E+4
FHB Ventilation Isolation	1.2E+5	9.5E+4
Containment Ventilation Isolation	5.0E+4	6.0E+3
U-1 Containment and FHB Ventilation Isolation	2.0E+4	9.5E+4
U-1&2 Containment and FHB Ventilation Isolation	2.0E+4	6.0E+3

NOTES

a. The default release duration (remaining duration) will be used every time MIDAS is run until Operations/Plant Management specifically tells dose assessment personnel that the release will be stopped within a specific time frame.

b. The key indications used to identify a faulted steam generator are an uncontrolled pressure decrease in at least one steam line or a steam generator that is completely depressurized.

c. The 1 hour default release duration for a non-faulted Steam Generator Tube Rupture (SGTR) is only to be used during the first hour of the release. If the release has not been stopped within the first hour, then a 4 hour release duration should be used.

5.1.2.6 If an estimate of release duration cannot be determined, use the following default release durations.

a. 1 hour for a non-faulted Steam Generator Tube Rupture (SGTR)

b. 4 hours for any other Design Based Accident (DBA)

NOTE

When the "High Alarm" set point is reached or exceeded on the release point gaseous effluent monitors (RE-12839C or RE-12444C), the ODCM limits are being exceeded. Contact Chemistry department if you have any questions when determining if the plant is above or below normal operating limits.

5.1.2.7 When completing items 10 through 15 on the Emergency Notification Network (ENN) form, refer to procedure 91305-C, "Protective Action Recommendations" for possible PAR's. If the release is below normal operating limits in item #12, then report all doses as less than 0.02 mRem in item #13.

5.2 THYROID DOSE FROM FIELD DATA

5.2.1 When air sample data is available from field measurements, and as directed by the Dose Assessment Manager or his designee, perform the following activities:

5.2.1.1 Obtain the net cpm data on the silver Zeolite (AgZ) or charcoal cartridge as reported by the field team to the Monitoring Team Communicator. This information is on Data Sheet 2 of Procedure 91303-C, "Field Sampling And Surveys".

5.2.1.2 Obtain the sample volume, in liters, for the sample specified in the preceding step.

5.2.1.3 Calculate the thyroid dose rate in Worksheet 1.

5.2.2 Report the result obtained in Worksheet 1 to the Dose Assessment Manager. The results may be compared to the field monitoring dose rate calculated by the MIDAS program. (FM Iodine Dose Rate Plot)

5.3 ANALYSIS OF FIELD MONITORING SAMPLES

5.3.1 Upon return of field teams to the vicinity of the EOF, the Dose Assessment Manager should ensure that the air and other samples (soil, vegetation and water) are collected for subsequent analysis.

5.3.2 Perform gamma spectroscopy analysis on the samples and record results.

5.3.3 Calculate the thyroid dose rate from the air sample results in accordance with Worksheet 1 by obtaining, from Chemistry, the isotopic concentration (μCi/cc) of each pertinent Iodine isotope from the gamma spectroscopy and multiplying it by the Dose Conversion Factor (mRem/hr/μCi/cc). To find the Thyroid CDE Dose Rate, simply add up the totals from the Base Rate Column (mRem/hr). Report the results to the Dose Assessment Manager. The results may be compared to the field monitoring dose rate calculated by the MIDAS program. (FM Iodine Dose Rate Plot).

5.4 FIELD MONITORING READINGS

NOTE

a. When performing a back calculation, using field-monitoring data, the MIDAS software program assumes the dose rate is measured at the plume centerline. The centerline radiation levels should be measured and input into the MIDAS back calculation (using Figure 3), as directed by the dose assessment manager.

b. When performing a back calculation, using field-monitoring data readings from low level radioactive plumes, a (3000 cpm/1.0 mR/hr) conversion factor will be used to convert count rate to dose rate.

Field monitoring measurements are important in determining the actual radiation levels in the environment. The dose assessment computer code provides only a rough approximation of radiation levels and location of the plume. The uncertainties in the source term and meteorological conditions in the affected areas are the chief contributors to the inaccuracies of projected dose and dose rate. There is no widely accepted formula on how to use field monitoring data to reduce the uncertainties and inaccuracies in the dose assessment computer code. The Dose Assessment Manager or HP Supervisor must exercise professional judgment in determining the proper correction factors.

5.5 STEAM GENERATOR TUBE RUPTURE/LEAK QUICK DOSE ASSESSMENT

5.5.1 A quick dose assessment for a steam generator tube rupture/leak which results in a release to the environment may be performed using this section when the following conditions exist:

b. The RCS leak rate as a result of the rupture/leak is less than 500 gallons per minute (GPM).

c. The release to the atmosphere is not monitored (i.e. Turbine Driven Aux. Feedwater exhaust, ARV cycling or stuck open S/G Code Safety valve).

NOTE

Chemistry may not be able to obtain a RCS Total Gaseous Activity sample unless affected unit is at normal operating temperature and pressure.

5.5.2 Using the most recent RCS chemistry sample, determine the Off Site Dose as follows:

RCS Total Gas Activity (μCi/cc)	Above or Below ODCM Limits	Off Site Dose TEDE and Thyroid CDE
≤ 1.0 E -01	Below	< .02 mRem
>1.0 E -01 but ≤ 1.0	Above	< 0.1 mRem
> 1.0 but ≤ 10	Above	< 1.0 mRem
> 10	Above	see 5.5.2.1 for ODA

5.5.2.1 If the RCS gaseous activity is greater than 10 micro curies per cc, a dose assessment should be performed as follows:

a. Using the MIDAS computer program, enter the RCS gaseous activity in micro curies per cc for monitor RE-12839C.

b. Determine the release rate in CFM by multiplying the RCS leak rate in GPM by 0.13, and enter this value for RE-12839 flow.

c. Use accident type Steam Generator Tube Rupture, one-hour release duration and real meteorology.

6.0 REFERENCES

6.1 VEGP EMERGENCY PLAN

6.2 PROCEDURES

6.2.1 91001-C, "Emergency Classifications And Implementing Instructions"

6.2.2 91002-C "Emergency Notifications"

6.2.3 91303-C, "Field Sampling And Surveys"

6.2.4 91305-C, "Protective Action Guidelines"

6.3 VEGP FSAR, Section 11.5.5, Post-Accident Radiation Monitoring.

6.4 VEGP FSAR, Section 2.3.4, Short Term Diffusion Estimates.

6.5 VEGP Offsite Dose Calculation Manual.

6.6 NUREG/CR-3011, "Dose Projection Considerations for Emergency Conditions at Nuclear Power Plants", 1983.

6.7 Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, 1977.

END OF PROCEDURE TEXT

Sheet 1 of 1

WORKSHEET NO. 1

THYROID DOSE RATE ($\dot{D}$) FROM FIELD MONITORING DATA

Sample No. _____ Time of Sample _____ Date _____ Location _____

A. FIELD DATA

1. Total volume of air sampled (V): _____ liters

2. Net cpm (Iodine) above background (N): _____ cpm
   (Data Sheet 2 of Procedure 91303-C)

B. Thyroid CDE dose rate ($\dot{D}$): _____ mRem/hr
(Use appropriate expression below to calculate)

NOTE

T is time since reactor shutdown until release occurred.

FOR **T** < 24 hr: $\dot{D} = \frac{N(12)}{V}$ FOR **T** >24 hr: $\dot{D} = \frac{N(65)}{V}$

SILVER ZEOLITE SAMPLE GAMMA SPECTROSCOPY RESULTS AND THYROID CDE DOSE RATE DETERMINATION

Radionuclide	(Concentration) μCi/cc	x	(Dose Conversion Factor) $\frac{\text{mrem/h}}{\mu\text{Ci/cc}}$	=	(Dose Rate) $\frac{\text{mrem}}{\text{h}}$
I-131		x	1.30E+9	=	
I-132		x	7.7E+6	=	
I-133		x	2.2E+8	=	
I-134		x	1.3E+6	=	
I-135		x	3.8E+7	=	
	(Thyroid CDE Dose Rate) $\frac{\text{mrem}}{\text{h}}$			=	

TABLE 1

SIGMA THETA TABLE

Atmospheric Stability by Standard Deviation of Horizontal Wind Direction, Sigma Theta

STABILITY CLASSIFICATION		SIGMA THETA (degrees)
A	Extremely unstable	≥ 22.5
B	Moderately unstable	22.5 to 17.5
C	Slightly unstable	17.5 to 12.5
D	Neutral	12.5 to 7.5
E	Slightly stable	7.5 to 3.8
F	Moderately stable	3.8 to 2.1
G	Extremely stable	<2.1

The accuracy of this method is poor when wind speed is less than 3.4 MPH.

FLOW CHART FOR DOSE ASSESSMENT USING MIDAS

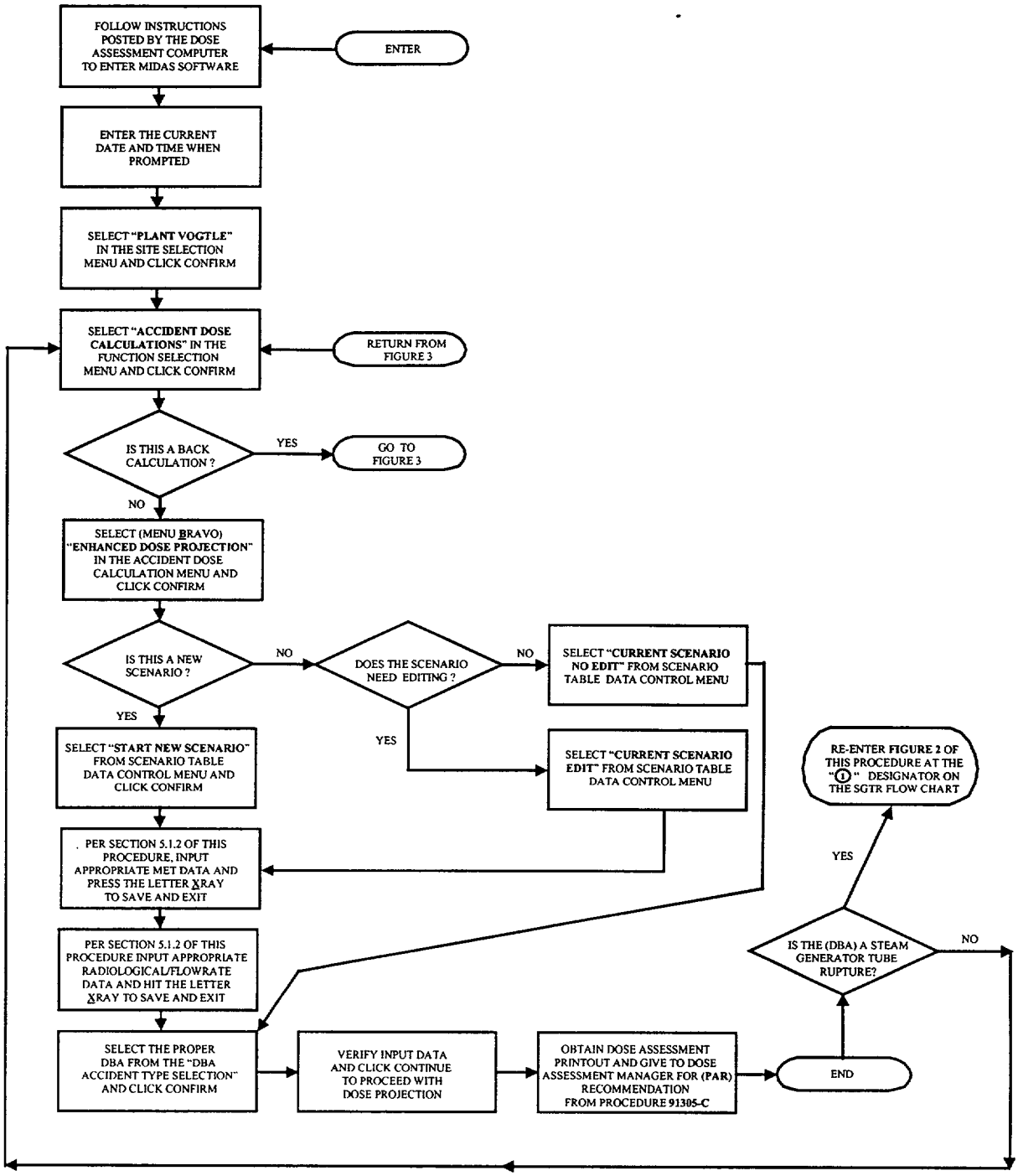
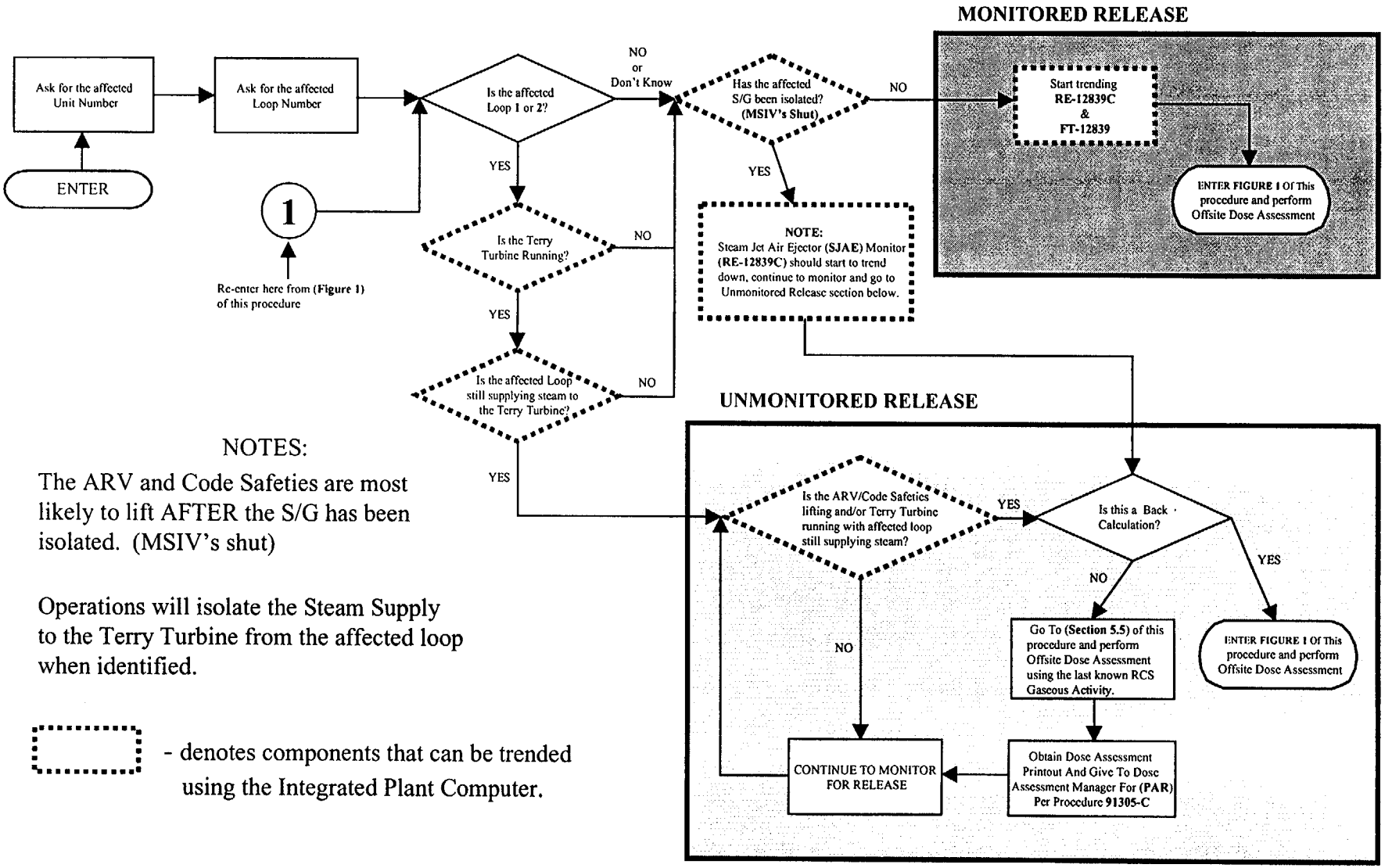


FIGURE 1

FLOW CHART FOR STEAM GENERATOR TUBE RUPTURE



NOTES:

The ARV and Code Safeties are most likely to lift AFTER the S/G has been isolated. (MSIV's shut)

Operations will isolate the Steam Supply to the Terry Turbine from the affected loop when identified.

- denotes components that can be trended using the Integrated Plant Computer.

FIGURE 2

FLOW CHART FOR DOSE ASSESSMENT BACK CALCULATION USING MIDAS

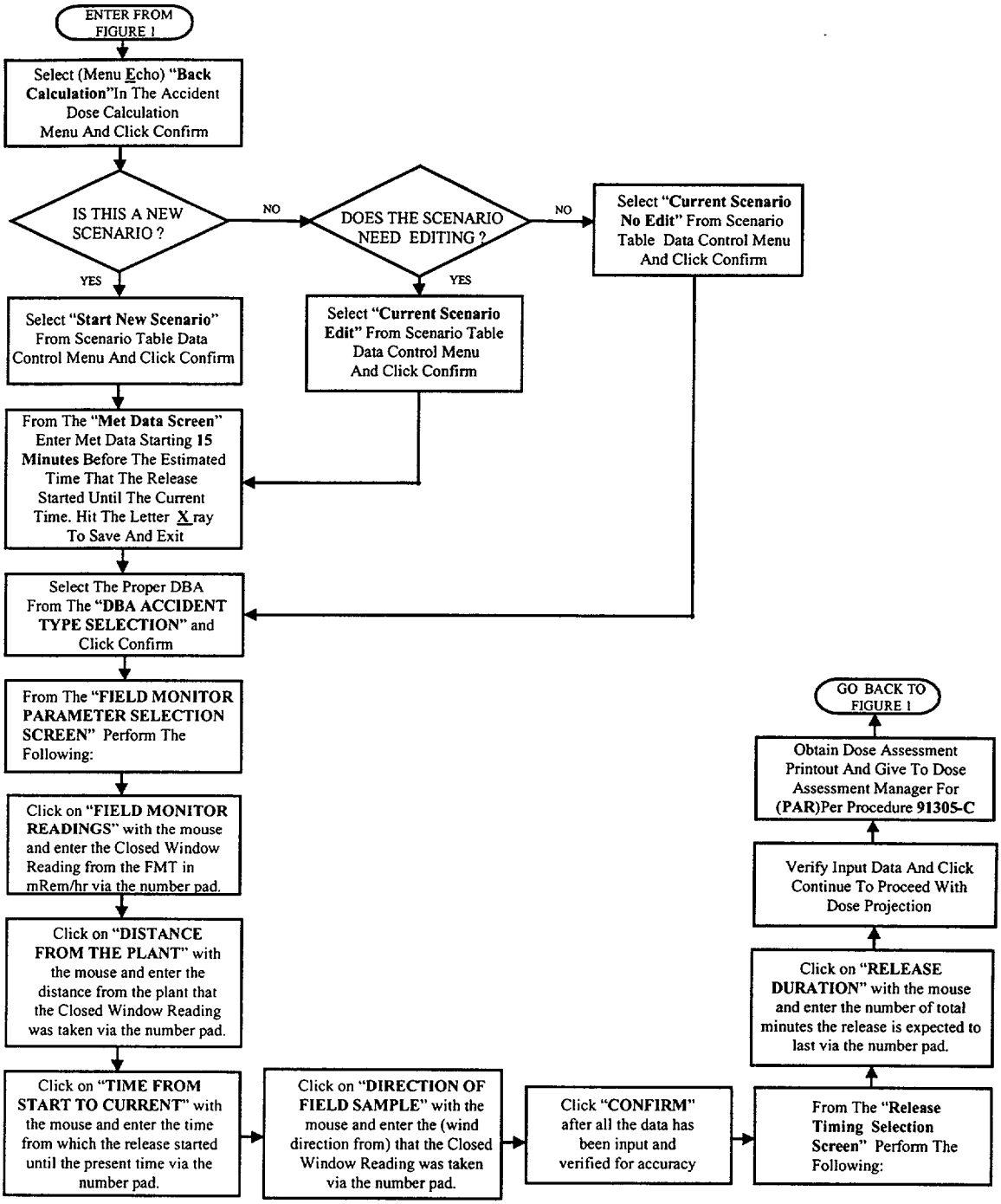


FIGURE 3

Sheet 1 of 1

DATA SHEET 1
DOSE ASSESSMENT MONITOR LOG

Time / Date	Primary 10 meter	Speed (mph)	Wind Dir.	Stability	Rain (in)	Duration (hrs)
/	Second. 10 meter					

	Reading	Flow	ARVs (1)	SRVs (5)	Terry Tb (5)
RE-12444C (Plant Vent)			N/A	N/A	N/A
RE-12839C (SJAE)			N/A	N/A	N/A
RE-005/006 (RB Area)			N/A	N/A	N/A
RE-13120 (MS Loop 1)					
RE-13121 (MS Loop 2)					
RE-13122 (MS Loop 3)					N/A
RE-13119 (MS Loop 4)					N/A

Unknown		*LOCA*		*WGDT*		*CR Eject*		*L Rotor*		*Stm Line*		*SG Tube*		*Fuel Hdl*	

	Reading (uCi/cc)
RCS Total Gaseous	

	*Rate (mr/hr)	Distance (Mi)	Time Measured
Field Data			

Remarks

Time / Date	Primary 10 meter	Speed (mph)	Wind Dir.	Stability	Rain (in)	Duration (hrs)
/	Second. 10 meter					

	Reading	Flow	ARVs (1)	SRVs (5)	Terry Tb (5)
RE-12444C (Plant Vent)			N/A	N/A	N/A
RE-12839C (SJAE)			N/A	N/A	N/A
RE-005/006 (RB Area)			N/A	N/A	N/A
RE-13120 (MS Loop 1)					
RE-13121 (MS Loop 2)					
RE-13122 (MS Loop 3)					N/A
RE-13119 (MS Loop 4)					N/A

Unknown		*LOCA*		*WGDT*		*CR Eject*		*L Rotor*		*Stm Line*		*SG Tube*		*Fuel Hdl*	

	Reading (uCi/cc)
RCS Total Gaseous	

	*Rate (mr/hr)	Distance (Mi)	Time Measured
Field Data			

Remarks

* - When performing a back calculation using field-monitoring data readings from low level radioactive plumes, a (3000 cpm/1.0 mR/hr) conversion factor will be used to convert count rate to dose rate.

DOSE ASSESSMENT CHECKLIST

INITIAL ACTIONS

NOTE

Shift Superintendent will be the source for the following information prior to Emergency Response Facility activation.

1.* Obtain the following information prior to performing Offsite Dose Assessment:

   a. Affected Unit Number

   b. Type of Design Base Accident occurring (i.e. LOCA, SGTR)

   c. Affected Loop Number if DBA is a Steam Generator Tube Rupture

   d. Plant Conditions (i.e. duration of release)

2. Go to (Figure 2) of this procedure if the DBA is a SGTR.

3. Go to (Figure 1) to perform Offsite Dose Assessment.

4.* Once the initial Offsite Dose Assessment has been completed, continue to monitor and trend those parameters that are needed for the DBA that is occurring.

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* Continuing Activity