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TITLE: OFFSITE DOSE PROJECTION RDACS
COMPUTER METHOD

REVISION NO: 030-00-0

CHANGE NO: AP-30

SUBJECT: NEW REVISION



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ANO-1 Docket 50-313

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**ENTERGY OPERATIONS INCORPORATED
ARKANSAS NUCLEAR ONE**

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TITLE: Offsite Projections - RDACS Computer Method

PROC/WORK PLAN NO.
1904.002

CHANGE NO.
030-00-0

SET # **103**

WORK PLAN EXP. DATE
N/A

TC EXP. DATE
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SAFETY-RELATED
 YES NO

IPTE
 YES NO

TEMP ALT
 YES NO

When you see these TRAPS

- Time Pressure
- Distraction/Interruption
- Multiple Tasks
- Over Confidence
- Vague or Interpretive Guidance
- First Shift/Last Shift
- Peer Pressure
- Change/Off Normal
- Physical Environment
- Mental Stress (Home or Work)

Get these TOOLS

- Effective Communication
- Questioning Attitude
- Placekeeping
- Self Check
- Peer Check
- Knowledge
- Procedures
- Job Briefing
- Coaching
- Turnover

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TIME

FORM TITLE:

VERIFICATION COVER SHEET

FORM NO.
1000.006A

CHANGE NO.
048-00-0

ENTERGY OPERATIONS INCORPORATED ARKANSAS NUCLEAR ONE

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<input checked="" type="checkbox"/> PROCEDURE <input type="checkbox"/> WORK PLAN, EXP. DATE <u>N/A</u>	PAGE <u>2</u> OF <u>2</u>
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TYPE OF CHANGE:

<input type="checkbox"/> NEW Procedure or Work Plan	<input checked="" type="checkbox"/> REVISION	<input type="checkbox"/> PC	<input type="checkbox"/> TC	<input type="checkbox"/> DELETION
	<input type="checkbox"/> EZ	EXP. DATE: <u>N/A</u>		

AFFECTED SECTION: (Include step # if applicable)	DESCRIPTION OF CHANGE: (For each change made, include sufficient detail to describe reason for the change.)
Task Guide A, Section D, Step 2	Added, "or as directed by the DAS"
Task Guide B I. Step E	Added, "if not already unlocked"
II. Step 2.a	Referenced Procedure Section 9.2
II. Step 2.f	Referenced RDACS Desk Guide
Task Guide C II. A.2	Delete Step #2 and renumber remaining steps
II. C. 1& 2	Referenced RDACS Desk Guide, Section 2.2 and 2.5 and 9.3.3 of this procedure
Task Guide E Statement	Referenced RDACS Desk Guide, Form 7.1B
II. A.3	Referenced RDACS Desk Guide Section 2.4
Task Guide F I. E	Clarified between Offline Drill and Online Live Data
II. A.1	Referenced Section 9.2 of this procedure
II A.2	Referenced Section 9.2 of this procedure
Attachment 5	Added Attachment 5, Emergency Classification Criteria

FORM TITLE: DESCRIPTION OF CHANGE	FORM NO. 1000.006C	CHANGE NO. 048-00-0
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1.0 PURPOSE

The purpose of this procedure is to provide instructions on the initial response requirements and task guidelines when responding as an Initial Dose Assessor/Dose Assessment Team (DAT) member during emergencies at ANO. The following is a list of possible response requirements when responding to an emergency:

Provide an initial estimate of the radiological conditions at the ANO Exclusion Area Boundary, provide information to determine the Emergency Action Level for subsequent classification into one of the four Emergency Classes, define the offsite area(s) potentially affected by an airborne radiological release, provide an estimate of the Total Effective Dose Equivalent (TEDE), Child Thyroid dose rates, formulate offsite radiological Protective Action Recommendations (PARs), allow for the determination of the atmospheric stability category based upon the position of the sun, the wind speed, and cloud conditions, provide radioactive release rate estimates for release points which do not have functioning SPING detector systems or release points which require local readout/sampling from the SPINGS and to refine projections based on available field monitoring data using the Radiological Dose Assessment Computer System (RDACS).

Additional Dose Assessment information and instruction may be found in the RDACS Desk Guide, which may be found on IDEAS, and a hard copy is located at each RDACS terminal.

2.0 SCOPE

- 2.1 This procedure describes the use of RDACS in three (3) different operating modes: auto mode, backup mode and forecast mode.
- 2.2 This procedure is applicable to airborne radioactive releases from ANO as indicated by the ANO Super Particulate Iodine Noble Gas (SPING) monitors or by other radiological monitoring devices used to assess unmonitored releases (e.g., Steam Line Monitors, containment leakage, and Main Steam Line Radiation Monitors.)
- 2.3 **[This procedure may be used to check stability class projections made from the onsite meteorological tower, or when determining the stability class when the onsite meteorological data is unavailable or is known to be inaccurate.]**
- 2.4 This procedure describes the notification and response process for the Initial Dose Assessor when responding to the Control Room and the DAT when responding to the Emergency Operations Facility (EOF) and Technical Support Center (TSC) during emergency conditions. Additionally, task guides detailing the duties of the Initial Dose Assessor/DAT are contained in Attachment 1 of this procedure.

3.0 DESCRIPTION

The RDACS is a network system which obtains and relays information to a series of computer terminals (nodes) located in the Unit One and Unit Two Control Rooms, the **[Technical Support Center (TSC)]** and the Emergency Operations Facility (EOF). The Control Room RDACS computers are continuously powered-up and will alarm whenever identified limits are exceeded (see section 9.2).

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The RDACS is a redundant system composed of two "File Servers", designated as "A" and "B", which continuously accept radiological release data from the eleven (11) ANO SPINGS and meteorological data from the meteorological tower via the Safety Parameter Display System (SPDS). If at any time one of the two file servers fail, the alternate file server assumes the lead for collecting and distributing data to the various nodes without any data loss or interruptions. (See Attachment 2 for RDACS Configuration Diagram)

The file server distributes accumulated information to the various nodes via a Local Area Network (LAN). If both file servers become inoperable for any reason, the user will then use the RDACS in its backup mode. The backup mode will require manual entry of SPING and meteorological data. If the LAN becomes inoperable, radiological and meteorological data may still be available to the nodes located in the Control Rooms. If the file server is lost, meteorological data will be available via the Unit One Control Room meteorological strip charts or through information obtained from the Corps of Engineers or Russellville Airport and the use of section 9.4.1.

4.0 REFERENCES

4.1 REFERENCES USED IN PROCEDURE PREPARATION:

- 4.1.1 Memorandum Number CL-2126 (A. Smith to File)
- 4.1.2 Detector Calibration Curves (Supplied by Nuclear Chemistry and I&C)
- 4.1.3 Memorandum Number NOD-89-105
- 4.1.4 Calculation Sheet No. 89E-0029-01 and 89E-0029-02 (Steam Line Monitor Calibration Factors).
- 4.1.5 ANO Condition Report 1-90-73
- 4.1.6 Memorandum RER-89-00551 dated February 8, 1989. (Meeting between National Weather Service and ANO Emergency Planning).
- 4.1.7 U.S. Department of Transportation/Federal Highway Administration, Region 15, Demonstration Project No. 38
- 4.1.8 Smithsonian Meteorological Tables, List, Sixth Revised Edition
- 4.1.9 "A Diffusion Model for an Urban Area", D.B. Turner, 1964, Journal of Applied Meteorology, February 1964, p. 91
- 4.1.10 "Workbook of Atmospheric Dispersion Estimates", D. B. Turner, 1970, p.6.
- 4.1.11 Emergency Plan

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- 4.1.12 EPA-400, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents"
- 4.1.13 Offsite Dose Calculation Manual" (ODCM)
- 4.1.14 Title 10, Code of Federal Regulations, Part 20 (10CFR20)
- 4.1.15 Methodology Manual, Emergency Dose Calculation Package, EDC/ 6600, Rev. 0, October 1982, Applied Physical Technology, Inc.
- 4.1.16 "Meteorology and Atomic Energy", U.S. Atomic Energy Commission, D.H. Slate, July 1968.
- 4.1.17 "Arkansas Nuclear One Evacuation Time Study", ANO Emergency Plan, Appendix 5.
- 4.1.18 OCNA048710
- 4.2 REFERENCES USED IN CONJUNCTION WITH THIS PROCEDURE:
None
- 4.3 RELATED ANO PROCEDURES:
 - 4.3.1 1604.051, "Eberline Radiation Monitoring System"
 - 4.3.2 1903.010, "Emergency Action Level Classification"
 - 4.3.3 1903.011, "Emergency Response/Notifications"
 - 4.3.4 1903.064, "Emergency Response Facility - Control Room"
 - 4.3.5 1903.065, "Emergency Response Facility - Technical Support Center (TSC)"
 - 4.3.6 1903.067, "Emergency Response Facility - Emergency Operations Facility (EOF)"
- 4.4 REGULATORY CORRESPONDENCE CONTAINING NRC COMMITMENTS WHICH ARE IMPLEMENTED IN THE PROCEDURE: **[BOLD]** DENOTES COMMITMENTS.
 - 4.4.1 **OCAN048704 (P-7879), Section 8.1.5.E and 9.2.7**
 - 4.4.2 **OCNA048609 (P-8878), Section 8.1.5 J, 9.2.6 C and Attachment 1 Task Guides**
 - 4.4.3 **OCAN038313 (P-4139), Section 8.1.5.E and 9.2.7**
 - 4.4.4 **OCNA018411 (P-9755), Section 8.1.5.E and 9.2.7**
 - 4.4.5 **OCAN079009 (P-1458), Section 3.0 and Attachment 2**
 - 4.4.6 **OCAN128012 (P-10421), Section 9.3.2**
 - 4.4.7 **OCAN128211 (P-10831), Section 2.3**
 - 4.4.8 **OCAN029301 (p-3742), Attachment 1, Task Guide "A"**

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5.0 DEFINITIONS

- 5.1 Auto Mode - The RDACS mode of operation in which the file server requests data from the SPINGS and meteorological tower, processes this data, transmits the processed data via the LAN to the requesting node from which the node can either display or print this processed data.
- 5.2 Backup Mode - The RDACS mode of operation in which current processed data is unavailable from the file servers. Previous data will be stored on the node of operation if the user has requested a plume update from the system before the failure. In backup mode, current data must be gathered from alternate data sources, entered into the model, the model executed and the resultant data either displayed or printed.
- 5.3 <> - Brackets represent a labeled computer button.
- 5.4 Ceiling - Height above the surface (in feet) of the bottom of the lowest layer of clouds, smoke, etc., which contributes to obscuring the sky.
- 5.5 Continuous Monitor File (CMF) - The files which contain raw meteorological and radiological data. The RDACS has three continuous monitor files; one for 2 minute data, one for 10 minute data, and one for hourly averaged data. The 2 minute file is 24 hours long, the 10 minute file is 15 days long and the 60 minute file is 60 days long.
- 5.6 Δt (delta t) - The vertical temperature differential between the upper and lower temperature sensors on the meteorological tower (in degrees Celsius).
- 5.7 Dose Evaluation Points - Eighty (80) different points within the 10-mile EPZ for which RDACS calculates off-axis dose rates and cumulative doses.
- 5.8 Emergency Kit - A compilation of supplies and equipment to be used during emergency situations. The Emergency Kit for both Control Rooms is located in the Unit One Control Room. There is an Emergency Kit, used by the DAT and OMS, which is located just outside the Dose Assessment Room at the EOF and an Emergency Kit located inside the TSC. The EOF also has Emergency Kits located inside the Command Room and in room 110. The OSC Emergency Kits are located just across from the freight elevator in the Maintenance Facility. (Downstairs from the POD Room/OSC) The OSC does not have an RDACS terminal.
- 5.9 Emergency Operations Facility (EOF) - A near-site emergency facility located approximately 0.65 miles northeast of the reactor buildings.
- 5.10 File Server - One of two redundant computers located in the SPDS room which collect radiological and meteorological data, process and store this data, and transmit this data to the requesting nodes.
- 5.11 Forecast Mode - The RDACS mode of operation in which all previous data segments can be updated to the working node, forecasted radiological and meteorological data are entered, processed and printed such that based upon estimates of future conditions, appropriate actions can be taken.

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- 5.12 Greenwich Mean Time (GMT) - The standard time in Greenwich, England. Most international weather data is listed in GMT, and is designated by the suffix 'Z'. Convert Greenwich Mean Time to Central Standard Time by subtracting 6 hours (or add 6 hours to convert CST to GMT). Subtract 5 hours to convert from GMT to Central Daylight Saving Time.
- 5.13 Initial Dose Assessor - One of several ANO personnel who have been trained to respond to the affected Unit's Control Room during emergencies to perform dose assessment calculations and formulate radiological Protective Action Recommendations (PARs).
- 5.14 Insolation Class - The relative strength of sunlight falling at a location, based upon the solar angle and assuming clear skies.
- 5.15 Local Area Network (LAN) - The communications system which allows processed data from the file server to be transferred to any node.
- 5.16 Net Radiation Index - A measure of the net heat gain (+) or loss (-) by the earth's surface, based upon the Insolation class and cloud conditions.
- 5.17 Nighttime - The period from one hour before sunset to one hour after sunrise.
- 5.18 Node - The terminals connected to the LAN that the user interfaces with to perform dose assessment functions.
- 5.19 Protective Action Guideline (PAG) - Cumulative radiological doses which the U.S. Environmental Protective Agency considers sufficiently hazardous to the health of the general public to warrant widespread protective actions, such as evacuation.
- 5.20 Protective Action Recommendation (PAR) - Recommended precautionary actions issued to offsite authorities which are based on radiological release data.
- 5.21 Radiological Dose Assessment Computer System (RDACS) - The primary and secondary data processing system used for dose assessment calculations. This system consists of two redundant file servers, a local area network and multiple nodes.
- 5.22 $\sigma\theta$ (sigma theta) - The standard deviation (net change) of the horizontal wind direction over time.
- 5.23 Solar Angle - The compound angle of the sun above the horizon.
- 5.24 Solar Declination - The angle of the sun north (+) or south (-) of the equator.
- 5.25 SPING - One of the eleven Eberline radiological air monitoring detectors connected to RDACS. Each SPING monitors a single physical release point for airborne particulates, iodines, and noble gases.

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- 5.26 Technical Support Center (TSC) - A location within the ANO Administration Building equipped with instrumentation and communication systems and facilities useful in monitoring the course of an accident; this center is located on the 3rd floor of the Administration Building.
- 5.27 Total Cloud Cover Fractional portion of the sky obscured by clouds, expressed in tenths as a decimal (including clouds at all altitudes).
- 5.28 X/Q - The ratio of the concentration of radioactive material (at a specific location) to the release rate (at the origin) in units of $\mu\text{Ci/cc/Ci/sec}$ which is equivalent to units of sec/m^3 .

6.0 RESPONSIBILITY AND AUTHORITY

6.1 SHIFT SUPERINTENDENT (SHIFTY)

- 6.1.1 Responsible for determining if an unplanned gaseous release to the environment is indicated by symptoms such as SPING monitor readings, area radiation monitor alarms or other indications.
- 6.1.2 The Shift Superintendent from the affected unit is responsible for notifying an Initial Dose Assessor to respond to the Control Room following indications of unplanned gaseous releases to the environment.
- 6.1.3 Responsible for ensuring that offsite dose projections are performed until relieved by the Dose Assessment Supervisor and for supplying backup meteorological data and "unmonitored release" data to the Dose Assessment Team, as necessary, throughout the incident.
- 6.1.4 Whenever the Shift Superintendent is responsible for Emergency Direction and Control, he shall review and approve Protective Action Recommendations and ensure that these recommendations are communicated to the appropriate offsite authorities.
- 6.1.5 Responsible for obtaining current meteorological data for use in completing offsite dose calculations until relieved by the Dose Assessment Supervisor.

6.2 INITIAL DOSE ASSESSOR (IDA)

- 6.2.1 The Initial Dose Assessor is responsible for performing dose assessment calculations and formulating radiological Protective Action Recommendations (PARs), using the RDACS, until relieved by the Dose Assessment Team. The duties and responsibilities of the IDA are specifically detailed in Attachment 1, Task Guide "A" of this procedure.

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6.3 DOSE ASSESSMENT TEAM MEMBERS (DAT)

6.3.1 The Dose Assessment Team members are to take Dose Assessment responsibilities from the IDA as soon as possible. The duties and responsibilities of the DAT are specifically detailed in Attachment 1, Task Guides "B" - "F" of this procedure.

6.4 DOSE ASSESSMENT SUPERVISOR (DAS)

6.4.1 Once dose assessment has been assumed by the EOF staff, the Dose Assessment Supervisor is responsible for tracking offsite doses, gathering forecasts and formulating Protective Action Recommendations (PARs). PARs generated by the Dose Assessment Team are then forwarded to the Radiological/Environmental Assessment Manager (REAM).

6.4.2 The DAS is responsible for the direction of the Dose Assessment Team including the order in which the steps of Procedure 1904.002 are implemented based upon actual event conditions.

6.4.3 Responsible for obtaining current and forecasted meteorological data for use in preparing offsite dose forecasts once the Dose Assessment Team has been established.

6.5 RADIOLOGICAL/ENVIRONMENTAL ASSESSMENT MANAGER (REAM)

6.5.1 The REAM is responsible for reviewing dose forecasts and selected PARs and forwarding appropriate PARs to the TSC Director/EOF Director for notification to offsite authorities.

6.6 TSC DIRECTOR (TSCD)

6.6.1 Whenever the TSC Director is responsible for Emergency Direction and Control, they shall review and approve Protective Action Recommendations forwarded to them by the REAM, or IDA, if the EOF is not staffed. The TSCD shall also ensure that these recommendations are communicated to the appropriate offsite authorities.

6.7 EOF DIRECTOR (EOFD)

6.7.1 Whenever the EOF Director is responsible for Emergency Direction and Control, they shall review and approve Protective Action Recommendations forwarded to them by the REAM. They shall also ensure that these recommendations are communicated to the appropriate offsite authorities.

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7.0 LIMITS AND PRECAUTIONS

- 7.1 This procedure describes only limited routine and emergency use of the RDACS computers. A wide range of additional capabilities are available. However, the occasional user should not attempt to use programs and commands which are not specifically described in this procedure and/or the RDACS Desk Guide.
- 7.2 This procedure provides a projection of the radiological conditions based upon measured release rates and meteorology; field monitoring is necessary to determine the actual conditions.
- 7.3 Actual terrain and weather conditions (e.g., precipitation) will generally limit the accuracy of the projected doses at a specific location.
- 7.4 The Emergency Dose Calculation (EDC) data files are circular in nature. When the last available new segment has been used, the next plume segment will write over the location of the first plume segment.
- 7.5 Following an actual event or drill/exercise in which the normal isotopic mix has been altered, the user shall re-enter the original values.
- 7.6 Once the user has begun processing plume updates in the RDACS backup mode, the RDACS system does not allow for the transfer of plume update information to the RDACS Auto Mode if it becomes available.
- 7.7 Whenever unmonitored releases, SPING data, isotopic distribution or scale factors are edited while in Auto Mode, these changes will edit values in the file servers and thus affect all RDACS nodes.
- 7.8 Messages acknowledged by the user from a particular RDACS terminal will not clear the displayed message on other RDACS terminals.
- 7.9 If any additional software has been added to the RDACS file servers and a particular node has not been turned on since that addition, the node being logged on will pause temporarily to load the most current software. An update box will appear on the screen during this process and will disappear once the update is complete. No user interaction will be required.
- 7.10 Protective Action Recommendations (PARs) formulated through the use of this procedure are based solely on radiological release data. Additional PARs are formulated by other sections of the Emergency Response Organization which are based on onsite plant conditions.
- 7.11 Calculations in this procedure and/or the RDACS Desk Guide are conservative; however, actual offsite doses and decision times may be higher or lower, and new recommendations should be considered whenever updated information becomes available.
- 7.12 If field data measurements are available prior to projected RDACS information, PARs may be developed using centerline field data.

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- 7.13 In order to print from the Unit Two Control Room RDACS terminal, it is necessary to insure that the printer control switch located adjacent to RDACS is in the correct position. For RDACS use the A/B switch should be in the "B" position labeled "RDACS PC".
- 7.14 The radiological release rate data source selected should be the best available. Data sources are listed below in order of preference:
- 7.14.1 RDACS SPING monitors. See RDACS Desk Guide.
- 7.14.2 Portable instrumentation and grab sample analyses
- 7.15 It is only necessary to calculate steam release rates if conditions exist as described in RDACS Desk Guide.
- 7.16 It is only necessary to calculate containment atmospheric leakage release rates, if conditions exist as described in the RDACS Desk Guide.

8.0 RDACS MENU STRUCTURE

8.1 General Menu Description

- 8.1.1 The RDACS computers are menu driven. Each menu selection has additional submenus. Menu options may be obtained in one of two ways:

A. Enter the number of the option on the keyboard.

NOTE

Menus with 9 or fewer options can be selected by pressing the corresponding number. For menus with more than 9 options, you would select both digits (i.e., option 10 would be selected by entering 1 and 0 and then <ENTER> while option 1 would be entered by simply depressing 1.

B. Use the cursor keys to highlight the chosen option followed by <ENTER>.

- 8.1.2 Each screen has a user system block at the bottom of the screen which defines the keys that can be used for option selection. The user should refer to this user system block for the appropriate key selection choices when using a particular screen.

- 8.1.3 When RDACS is brought up from a powered-off state, a menu will appear which will ask you to "Choose Operating Environment". From this menu, you have two options:

- A. Online Live Mode - this option is used to select current real-time data and dose assessment during real emergency situations.
- B. Offline Drill Mode - this option is used to select data currently stored in files for use in drills and exercises.

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8.1.4 Gaseous Effluent Monitor - Main Menu

- A. RDACS Subsystem - this option is used to view any processed plume segment and print all associated plume data.
- B. SPING Subsystem - this option is used to manipulate and control the SPING(s) and associated SPING parameters.
- C. System Status - this option is used to view the SPING and met tower parameters. Parameters may be viewed for a 15 second, 2 minute average or 10 minute average duration.
- D. Status Change Report - this option is used to view information caused by a SPING/meteorological status change and to allow the user to edit release/meteorological parameters. This report is updated whenever status changes occur.
- E. EAL Report - this option is used to view/print the most recent site boundary dose information and associated Emergency Class. The user may also view previous EAL Reports. This report is generated and updated every 2 minutes once release limits have been exceeded.
- F. Data Display - this option is used to view and trend current and/or historical data from the SPINGS and meteorological tower.
- G. Alarm Log Viewer - this option is used to view and acknowledge any alarm on the system.
- H. Data Acquisition Maintenance - this option is used to edit the release rates for releases from SPINGS that have failed. This editing is normally done from the Status Change Report screen whenever failures have occurred during Emergency Dose Calculation (EDC) processing.
- I. ERDS Subsystem - This menu is used to send key operational data to the NRC whenever an Alert or higher emergency class has been declared. This option is only operational on selected RDACS terminals (e.g. Control Room).

8.1.5 RDACS Subsystem Main Menu

- A. Initialize RDACS - this option is used to initialize all system files in the event you have no live data from the SPINGS or meteorological tower, the RDACS file servers are out of service, or the Local Area Network is not operational. This option can only be used in backup and forecast modes.

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- B. Enter Plume Update - this option is used to enter current or forecasted data into the model.
1. Update Parameters & Meteorology - this option is used in backup and forecast modes to enter current or forecasted meteorological data.
 2. Releases from Monitored Points - this option is used in backup and forecast modes to enter current or forecasted radiological data from monitored release points.
 3. Releases from Unmonitored Points - this option is used in auto, backup and forecast modes to enter current or forecasted radiological data from unmonitored release points.
 4. Dose Scale Factors - this option is used in auto, backup and forecast modes to enter the current correction factors for matching the models projected data to the actual data measured in the field.
 5. Isotopic Distributions - this option is used in auto, backup and forecast modes to enter the current isotopic distribution determined by sampling an active release point.
 6. Revise Model Constants - Item not active.
 7. Execute Model - this option is used in backup and forecast modes to process manually entered data.
- C. Display Plume Data - this option is used to view on the screen data processed for each plume segment.
1. Emergency Class - this option is used to view the current emergency class calculated by the model after processing is complete.
 2. Plume Segment Data - this option is used to view the current plume characteristics and parameters for drawing the plume on a ten-mile EPZ map.
 3. Plume Centerline Data - this option is used to view the centerline dose values for a variety of distances down the centerline of the plume.
 4. Dose Evaluation Points - this option is used to view data calculated at the dose evaluation points for Total Effective Dose Equivalent (TEDE) dose rate, TEDE cumulative dose, Child Thyroid dose rate and Child Thyroid cumulative dose.

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5. Plume Update Input - this option is used to view meteorological, radiological, scale factor and isotopic distribution data for the current plume segment.
- D. Print Plume Data - select this option to print data processed for each plume segment.
1. Routine Reports (prints 2-7) - this option is used to print the entire report for a projected or forecasted plume update.
 2. Emergency Class - this option is used to print the current emergency class calculated by the model after processing is complete.
 3. Plume Segment - this option is used to print the current plume characteristics and parameters for drawing the plume on a ten-mile EPZ map.
 4. Plume Centerline - this option is used to print the centerline dose values for a variety of distances down the centerline of the plume.
 5. Dose Evaluation Points - this option is used to print data calculated at the dose evaluation points for TEDE dose rate, TEDE cumulative dose, Child Thyroid dose rate and Child Thyroid cumulative dose.
 6. Plume Parameters and Meteorology - this option is used to print meteorological data used for a particular plume segment.
 7. Release Rates - this option is used to print radiological data used for a particular plume segment.
 8. Dose Scale Factors and Isotopic Distributions - this option is used to print the current dose scale factor information as well as isotopic distribution information for each release point.
- E. [Protective Action Recommendation - This option allows the RDACS user to calculate a protective action based on dose rate and meteorological information.]
- F. Accept New Update - This option allows the user to accept calculated plume data from the file server in response to a "New Update Available" message.
- G. Draw Plume Map - This option allows the user to view a displayed 1, 10 or 50-mile EPZ map showing the projected position of a radioactive plume along with dose data and the derived emergency class.

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- H. Switch Operating Modes - This option allows the user to switch from one operating mode to another and transfers a user specified number of updates from the current mode of operation to the specified mode of operation.
- I. Terminate an Event - This option is used by the Emergency Planning/Computer Support groups to terminate an event once a release has stopped and conditions are favorable to do so (i.e., possible duplication to a backup data source).
- J. [RDACS/Field Data Comparison Sheet - This option prints the most recent RDACS update centerline dose rates to allow the user to log and compare with field team dose rate information. This report also provides a ratio of the RDACS TEDE dose rates to Whole Body Gamma dose rates.]

9.0 INSTRUCTIONS

9.1 DOSE ASSESMENT NOTIFICATION/ACTIVATION

9.1.1 Initial Dose Assessor (IDA)

- A. The Initial Dose Assessor will be contacted by the affected Unit's Control Room, by either the plant paging system or by plant telephone.
- B. Report to the Shift Superintendent in the affected Control Room. Dose Assessment paperwork/information is to be reported to the Shift Superintendent. For specific duties and responsibilities of the IDA, refer to Attachment 1, Task Guide A.

9.1.2 Dose Assessment Team (DAT)

- A. The Dose Assessment Team will be activated at an Alert emergency class or higher. During routine work hours, the Dose Assessment Team personnel onsite should be contacted either by the plant paging system or plant telephone.
- B. After routine work hours, Dose Assessment Team personnel will be contacted by the Computerized Notification System (CNS) or by the Dose Assessment Supervisor, whenever the CNS is out-of-service. Dose Assessment paperwork/information is to be reported to the DAS. For specific duties and responsibilities of the DAT members, refer to Attachment 1, Task Guides B - F.

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9.2 RDACS OPERATION - AUTO MODE

NOTE

This section describes the use of RDACS in the Auto Mode with no additional problems noted (i.e., unmonitored release, loss of SPING). Refer to additional sections within Section 9.0 to perform other functions as necessary.

If the Auto Mode fails prior to or during any plume processing, refer to Section 9.5, "Status Change Report".

If while you are in AUTO Mode, an unmonitored release is detected, go to Section 9.4, "RDACS Operations - Backup Mode".

- 9.2.1 Under normal conditions, the RDACS terminal in the Control Room will be displaying either the Gaseous Effluent Monitor Main Menu or the System Status display. The DAT members in the EOF and TSC must power up their RDACS terminals. RDACS keys may be found in the TSC Emergency Kit and the EOF Dose Assessment Emergency Kit.

NOTE

Powering up both RDACS terminals in the Dose Assessment room, allows one terminal to be used for forecasting/trend plotting. Go ahead and power up the State's RDACS terminal also.

NOTE

Gaseous effluent limits now reside in the ODCM. The "Tech. Spec. Limit Exe'd" message in RDACS will not reflect this change until the software change has been completed.

- 9.2.2 The RDACS terminals may be used at any time to display SPING status for any of the 11 SPINGS. To observe the current SPING status and radiological parameters, the user must select **Option 3, "System Status"**, from the Gaseous Effluent Monitor Main Menu.
- 9.2.3 The Gaseous Effluent Monitor Main Menu will be displayed on the screen. Select either:
- A. **Option 1, "Online Live Mode"** for emergencies.
- Or
- B. **Option 2, "Offline Drill Mode"** for drills or exercises.

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9.2.4 If a "Tech Spec. Limit Exe'd" message appears, silence the alarm when you arrive at the RDACS terminal. Select Option 7, "Alarm Log Viewer", from the Gaseous Effluent Monitor Main Menu, and press <Enter>. Then depress the <F8>, "Acknowledge Key". Press the <F10> key to exit and return to the Gaseous Effluent Main Menu.

Tech Spec Limit Exe'd - Alarm Log Entry will be generated if:

- A. SPING indicates measured levels above the alarm/trip setpoint
- B. Power to a SPING is lost
- C. SPING indicates downscale failure
- D. SPING controls are not set on the operate mode.

9.2.5 For an EAL Report Generated message, select Option 5, "EAL report" from the Gaseous Effluent Monitor Main Menu and press <Enter>. Depress <F8> to acknowledge the alarm. To print the EAL Report, depress the <F9> key. Review the report to determine the current site total TEDE and Child Thyroid dose rates. Determine the Emergency Class and the basis for the classification. If it is a new Emergency Class or is different from the previous class, update the person you report to as quickly as possible. Press the <F10> key to exit and return to the Gaseous Effluent Main Menu.

- A. An "EAL Report Generated" message will appear when site total dose rates are nearing or exceeding emergency classification limits.
- B. If the TEDE and Child Thyroid limits are exceeded, Emergency Dose Calculations (EDC) will begin and the dose calculations, plume display and emergency class will be available once a 10-minute segment boundary has been crossed.

9.2.6 If the "New Update Available" message appears, select Option 1, "RDACS Subsystem Menu" from the Gaseous Effluent Main Menu, and press <Enter>. Then select, Option 6, "Accept New Update", from the RDACS Subsystem Main Menu. This option transfers the currently stored plume parameter data from the file server to the terminal being used. This operation may take several minutes to complete.

- A. Upon completion of this transfer, the user should select Option 4, "Print Plume Data" from the RDACS subsystem Main Menu and press <Enter>. (DAT in the EOF, print out two copies, or make a copy of the one printout, to provide one copy to the REAM and one copy to the DAS)

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- B. Select Option 1, "Routine Reports" from the Print Plume Data Menu and press <Enter>. Enter the plume update number you want to print and depress <F9> to obtain the print out. The user may also display this information to the screen by proceeding through Option 3, "Display Plume Data" on the RDACS Subsystem Main Menu as opposed to the Print Plume Data option. The IDA should provide the Shifty with the Emergency Class Report as soon as possible, and as time permits, provide them with the rest of the Routine Report and the PAR printout.
- C. [Remove the last page from the RDACS Routine Report, which is the "RDACS/Field Data Comparison Sheet", and route this sheet to the DAT Map Maker.] (The IDA may throw this page away.) Press the <F10> key twice to exit and return to the RDACS Subsystem Main Menu.

NOTE

Movement on the PAR screen requires the use of the <TAB> key. Data must be entered into the appropriate highlighted areas before RDACS will allow you to proceed to the next step.

The Average Release Rate Factor and Expected Release Duration will have to be estimated.

Initial Dose Assessor only, request "Average Release Rate Factor" and Expected Release Duration" from one of the following:

1. *Shift Superintendent
2. TSC Director
3. TSC Operations Manager

9.2.7 Once you have obtained an RDACS Routine Report select [Option 5, "Protective Action Recommendation"] from the RDACS Subsystem Main Menu and press <Enter>. Perform the following steps:

- A. Average Release Rate Factor - Request the forecasted average airborne radioactive release rate for the duration of the release, based upon configurations of system temperature, pressure, planned remedial actions, probable failures, etc. from the Dose Assessment Supervisor. Enter a factor (e.g. if expected to double then enter a factor of 2.

If unknown, enter a factor of "1".

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- B. Expected Release Duration - Enter known release duration in hours (e.g. if 15 minute release, enter .25).

If unknown, enter 4 hours.
- C. Current Sky Condition - Move the cursor to the correct bracket using the arrow keys and depress the <SPACE> bar.
- D. Wind Direction - Automatically entered. You may overwrite these values as required.
- E. Centerline Dose Rates - Automatically entered. You may overwrite these values as required.
- F. Depress the <F2> key to calculate a Protective Action Recommendation (PAR).
- G. Print the calculated PAR by depressing the <F9> key.

9.2.8 Once the printout is completed, depress <F10> to return to the RDACS Subsystem Main Menu, and select **Option 7, "Draw Plume Map"** and press <Enter>. A plume map will be displayed on the screen along with additional TEDE radiological data and meteorological data.

- A. To select the plume map type - Depress <F4> to cycle through the TEDE and Child Thyroid plume maps. Select the plume map type upon which the "Emergency Class Report" is based.
- B. Then depress <F5> to cycle through the 1-mile, 10 mile and 50 mile maps. Select the map size which displays the best view of the plume. To print the map, depress <F9>. It may take 1-2 minutes for the map to print. Then depress <F10> to return to the "RDACS Subsystem Main Menu" Review the RDACS report, plume map and PAR printouts with the Dose Assessment Supervisor (DAS) and/or Shifty. (DAT in the EOF, print out two copies, or make a copy of the one printout, to provide to the REAM and one copy to the DAS)

9.2.9 Following the initial generation of the plume segment data, plume map and resulting PAR, RDACS will alert the user whenever the next plume segment data is available by flashing a **"New Update Available"** message at the top of the screen. Return to the "RDACS Subsystem Main Menu" by depressing <F10> then repeat Steps 9.2.6 - 9.2.8 at the frequency prescribed by the Dose Assessment Supervisor/Shifty

9.2.10 From the RDACS Subsystem Menu, press <Shift> and <F10> to return to the Gaseous Effluent Main Menu.

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9.3 RDACS OPERATIONS - FORECASTING

NOTE

This section should be performed using the additional RDACS terminal available to the Dose Assessment Team which is not being used as the primary RDACS terminal.

RDACS will allow the user to forecast for a maximum time period of 23 hours and 59 minutes at one time.

9.3.1 Meteorological Forecasting

- A. Obtain the most recent meteorological forecast for the Russellville area (Pope County) from one of the following sources listed in order of preference:

NOTE

Forecast may be obtained from the Entergy Dispatcher in two ways. Via a network computer with access to ANO-RER1 file server or via telephone.

1. [Using Network Computer:

- a. Sign on a network computer using personal login ID.
- b. Forecast data can be obtained on-line via the ANO Net and the World Wide Web. See RDACS Desk Guide for instructions.
- c. Print forecast to a local printer.

2. National Weather Service - Meteorologist-in-Charge (834-0308 or *834-3955*)]

3. KARV Radio (968-1184)

- B. Enter the appropriate information onto the Forecasting Worksheet. (Refer to the RDACS Desk Guide Form 7.1C)

9.3.2 Obtaining a Site Release Rate Forecast

- A. Complete the RDACS Desk Guide "Forecasting Worksheet", Form 7.1C. Refer to the RDACS Desk Guide, Section 2.5, for additional instructions

9.3.3 Dose Forecast Processing

- A. From the RDACS Subsystem Main Menu, select Option 8, "Switch Operating Modes".
- B. Select the <F1> key to get a listing of the possible modes.

The material contained within these symbols () is proprietary or private information.
 C. Using the cursor keys, move to the "FORECAST" selection and then <CR>.

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- D. Enter the number of updates that have previously been calculated in "Auto Mode" so that they may be transferred to the forecast files, then depress <F2>. When this transfer is completed, depress <F10> to return to the RDACS Subsystem Main Menu. If no updates have been calculated, then **Initialize RADCS** to remove old data. (See section 9.4.3)
- E. Select Option 2, "ENTER PLUME UPDATE".
- F. From the ENTER PLUME UPDATE MENU, select **Option 1, "UPDATE PARAMETERS & METEOROLOGY"**.
- G. Using the completed "Forecasting Worksheet", enter the termination time of the first "TIME BLOCK" listed on line "9B" next to the TIME STAMP of current update request, then <CR>.
- H. Enter the stability class, wind speed and wind direction using lines 14, 15 and 16 of the worksheet. (Wind speed and wind direction should be the same for both meteorological stations. See Attachment 3 to select the correct sigma theta value for the stability class.)
- I. Select the <F2> key to enter the meteorological data for the first time block.
- J. Return to the ENTER PLUME UPDATE MENU by selecting the <F10> key.
- K. If an unmonitored release is involved in the current release from site, select **Option 3, "Releases From Unmonitored Points"**, otherwise, continue with Step L.
- L. If no unmonitored release is involved in the current release from site, select Option 2, "Releases From Monitored Points".
- M. Select the point from which the worst release is occurring from site and enter the release rates for particulate, iodine and noble gas listed on lines 11, 12 and 13 of the worksheet. Enter this data by selecting the <F2> key.

 The material contained within these symbols (*) is proprietary or private information.
- N. Return to the ENTER PLUME UPDATE MENU" by selecting <F10>.

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NOTE

Before choosing Option 7, "Execute Model", make sure meteorological data and radiological data have been entered. If both have not been updated and Option 7, "Execute Model" is chosen, this will cause the year to change, causing the calculations to be incorrect. If the year changes, you must "Initialize" and begin entire process again.

- O. Select Option 7, "Execute Model".
- P. Repeat Steps F - O for each summary time block listed on the Forecasting Worksheet.
- Q. Once all of the time blocks have been entered, return to the RDACS Subsystem Main Menu and select Option 4, "Print Plume Data".
- R. Perform sections 9.2.6.B through 9.2.8 of this procedure to obtain an RDACS Routine Report, plume map and PAR for this forecasted release.

9.4 RDACS OPERATIONS - BACKUP MODE

NOTE

Once the backup mode is used for processing plume updates, RDACS does not allow plume segments to be transferred from Backup Mode to Auto Mode.

This section will only be used whenever RDACS has failed in the Auto Mode due to a loss of certain primary functions (e.g., loss of both file servers or LAN) or an "unmonitored" release is involved. The user will be alerted whenever the Auto Mode is lost by a displayed failure message on the screen upon startup or a loss of update messages expected every 10 minutes while operating RDACS.

If an unmonitored release and a monitored release occur simultaneously, the release rates for the effected sping(s) can be obtained from the "Release Parameters" printout (9.4.1.B). These values should be entered per section 9.4.4.F under "Release from Monitored Points" and updated for each report printed.

9.4.1 Determine Current Release Rates and Meteorological Data

NOTE

If operating RDACS from the Alternate EOF, proceed to Section 9.9 to obtain Release Rate and Meteorological Data.

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A. If you have not determined the release rates, refer to the RDACS Desk Guide located at all RDACS terminals. Refer to Section 2.6 of the RDACS Desk Guide to select the appropriate worksheet for the situation. (i.e., unmonitored steam release, unmonitored release outdoors, etc) Complete the excel worksheet to determine release rates and print out form for entry into RDACS after switching to Back up mode and initializing in sections 9.4.2 and 9.4.3. Any forms printed out must be retained for records keeping.

B. Obtaining Meteorological Data

1. If Meteorological Data is available from RDACS
 - a. Obtain a print out of the current 10 minute averaged Meteorological Data from the RDACS terminal, select **Option 6, "Data Display"** from the Gaseous Effluent Monitor Main Menu.
 - b. Select **Option 3, "Release Parameters"**. The 10 minute average release rate data for all 11 SPINGS and the onsite meteorological data will be displayed on the screen. Print this page by selecting **<F9>**.

NOTE

The "Release Parameters" printout does not include the current temperature. You may obtain this from the "System Status" screen.

2. If the meteorological data is unavailable from RDACS
 - a. If the onsite meteorological system is in service, meteorological data may be obtained from Recorders WDR 9300, WSR 9300, and AAR 9300 located in the Unit 1 Control Room Cabinet C29. Enter this data appropriately and determine the stability class. (Refer to the RDACS Desk Guide, Section 2.2).
 - or
 - b. If the onsite meteorological system is out of service, obtain the current wind speed and wind direction from the Dardanelle Dam Corp of Engineers, (*968-5008) or the Russellville Airport, (968-2360) and determine the stability class. (Refer to RDACS Desk Guide, Section 2.2).

- C. Dose Assessment Team - Report all results to the Dose Assessment Supervisor
- D. The calculated release rates and meteorological data will be entered into the model later in this Section, after switching to Backup and Initializing.

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9.4.2 To switch to "Backup"

- A. Select Option 1, "RDACS Subsystem Main Menu", from the Gaseous Effluent Monitor Main Menu.
- B. Select Option 8, "Switch Operating Modes", from the RDACS Subsystem Main Menu.
- C. Depress <F1>, using the cursor key, move to "Backup". Then select by depressing <CR>:
 - 1. If you are starting up RDACS initially or if no updates have been calculated previously in "Auto Mode", enter "0" into the plume update number field, then select <F2> to complete the switch to "Backup". Depress <F10> to return to the "RDACS Subsystem Main Menu", and proceed with Section 9.4.3.
 - Or
 - 2. If updates have been calculated previously using the "Auto Mode", then enter the total number of updates previously calculated, depress <F2> then depress <F10> to return to the "RDACS Subsystem Main Menu", and proceed with Section 9.4.4.

NOTE

Do not initialize if plume data transmitted.

9.4.3 Initialize RDACS as follows:

- A. From the RDACS Subsystem Menu, select Option 1, "Initialize RDACS".
- B. To select "Initialize", depress the "Y" key.
- C. To enter the initializing date and time.
 - 1. Enter the "Release Start date" into the "Date Field", then depress <Tab>.
 - 2. Enter the "Release Start Time" in the "Time Field", then the cursor will return to the "Yes/No" field.
 - 3. Complete initializing by depressing the <F2> key. RDACS will return to the "RDACS Subsystem Main Menu".

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9.4.4 Enter the values obtained for release rate and meteorology by performing the following:

- A. From the RDACS Subsystem Main Menu, select:
Option 2, "Enter Plume Update".
- B. Select Option 1, "Update Parameters and Meteorology".
- C. For the "Current Update Time":
 1. If the release has stopped, enter the release stop time or the time that gives an update interval equal to the total release time, then depress <CR> and proceed to Section D below.
 2. If the release is continuing, enter the approximate time of the data which was used for the release rate worksheet calculation. Then depress <CR>.
- D. Enter Windspeed (mph), Wind Direction (Degrees from), and Atmospheric Stability Class from either of the following sources:
 1. Meteorological Data from the RDACS printout of "Release Parameters".
 - a. For Monitored releases use data from the 57 meter tower.
 - b. For Unmonitored releases use data from the 10 meter tower.

Or

 2. Meteorological Data from the "Determining Atmospheric Stability" worksheet that was calculated earlier.
 3. If necessary, use 1904.002, Attachment 3 to select the Sigma-Theta that corresponds to the current stability class.
- E. Once the entries have been made, depress <F2>.
Then depress <F10> to return to the "Enter Plume Update" menu.
- F. Depending upon the previously determined release pathway(s), select one or both:
Option 2, "Release From Monitored Points".
Option 3, "Release From Unmonitored Points".
- G. Enter the release rates for particulate, iodine, and noble gas and depress <F2>.

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- H. If a release has terminated, remove the applicable release rates before processing the next update.
- I. Depress <F10> to return to the "Enter Plume Update Menu".

NOTE

Before choosing Option 7, "Execute Model", make sure meteorological data and radiological data have been entered. If both have not been updated and Option 7, "Execute Model" is chosen, this will cause the year to change, causing the calculations to be incorrect. If the year changes, you must "Initialize" and begin entire process again.

- J. Select Option 7, "Execute Model".
- K. Depress <F10> to return to the "RDACS Subsystem Main Menu".
- L. To print reports, refer back to steps 9.2.6.B - 9.2.8.

When in the back-up mode, "New Update Available" messages will not appear. Each plume update will require manual data entry into RDACS. Refer to steps 9.4.4 A - L.

9.5 STATUS CHANGE REPORTS

- 9.5.1 A Status Change Report (SCR) message will be displayed on the RDACS terminal whenever a SPING changes status (e.g., Good to Missing) or meteorological data is missing and Emergency Dose Calculations (EDC) have started.
- 9.5.2 If a SCR message appears on the RDACS terminal, select Option 4, "Status Change Report", from the Gaseous Effluent Monitor Main Menu and depress the <F8> key to acknowledge the message.
- 9.5.3 The user should note the following indications on the screen:
 - A. When a SPING or a meteorological data channel has changed from "Good" to "Bad", those areas will be highlighted by blue fields. RDACS will continue to process using the previous value until the user edits this value. If the affected SPING is not a major contributor to the site total release, the user may wish to place certain channels on this SPING in STANDBY (refer to section 9.5.5). If the SPING is a major contributor to the site total release, refer to section 9.4.1 of this procedure to determine new SPING/meteorological data and then continue with section 9.5.4.

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- B. When a SPING or a meteorological data channel has changed from "Bad" to "Good", those areas affected will be highlighted by green fields. RDACS will automatically obtain and use these values during the next update.

NOTE

If the meteorological data is staying the same, it is best to leave values alone and let RDACS use last set of good data for calculations.

9.5.4 Editing for Missing SPING/Meteorological Data

- A. Once new values have been obtained for those SPINGS/ meteorological channels determined in Section 9.5.3, you may edit new values into RDACS from the Status Change Report Screen.
- B. Using the cursor keys, move to the highlighted blue field that you wish to edit and type in the new value(s). Depress the <F2> key.
- C. Once new values have been entered into the system, RDACS will begin using these values for all updates that follow until manual numbers are removed.
- D. When SPING or Meteorological data channels change from "bad" to "good", it is necessary to set system back to normal and to remove the manually entered numbers from the system.
- E. Go to the "Status Change Report" screen. Tab to the field with the manually entered data (Ceyenne display) and type "NONE" in ALL CAPS and <F2> to save. This will set the "live" data back to "off scan" and "average" data to "On Scan", as it should be.

9.5.5 Placing SPINGS in Standby Mode

CAUTION

SPINGS should only be placed in standby when no suspected release via this SPING is expected. The user should notify the Dose Assessment Supervisor prior to performing this section.

- A. If any SPING continually initiates a status change alarm and is not considered a major contributor to the site total release, the user may desire to place the affected SPING channels in STANDBY MODE.
- B. From the Gaseous Effluent Monitor Main Menu, select Option 2, "SPING Subsystem".
- C. From the SPING Subsystem Menu, select Option 1, "SPING Control".
- D. Using the cursor keys, move to the SPING of choice, then enter <RETURN>.

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- E. Select the channel that you wish to put on standby which was previously identified on the Status Change Report and then <RETURN>.
- F. Select **Option 6, "Standby-On"** using the cursor arrows and then <RETURN>. Verify your selection has been displayed onto the command block on the screen.
- G. Repeat steps D-F for each SPING that is to be placed in STANDBY.
- H. Once all channels affected have been placed in STANDBY, return to the Gaseous Effluent Monitor Main Menu by depressing the <F10> key.

9.6 CENTERLINE DOSE RATE ADJUSTMENTS FOR FIELD DATA - SCALE FACTORS

CAUTION

Perform this section only as directed by the Dose Assessment Supervisor. Scale Factors edited in the RDACS "Auto Mode" will automatically change the values on the file server.

- 9.6.1 Obtain the most recent RDACS/Field Data Comparison Sheet generated with the RDACS Routine Report and enter the RDACS and field data centerline dose rates onto the Dose Scale Factor Worksheet, Form 7.1B of the RDACS Desk Guide, for both Noble Gas (gamma) and Iodine. Refer to RDACS Desk Guide, Section 2.4, for instructions.
- 9.6.2 From the RDACS Subsystem Main Menu, select **Option 2 "Enter Plume Update"**.
- 9.6.3 From the Enter Plume Update Menu, select **Option 4, "Dose Scale Factors"**.
- 9.6.4 Enter the new Noble Gas and Iodine scale factor values from "Dose Scale Factor" form.
- 9.6.5 Press the <F2> key to enter the value into the model. The message "Record Updated" should appear at the bottom left of the screen. Depress <F10> to exit the screen.
- 9.6.6 If in "Auto Mode" the next available plume segment will use the new dose scale factor information when calculating the next plume segment.
- 9.6.7 If in "Backup Mode" the new dose scale factor will be used when all data for the next plume segment is entered and that segment is processed.

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9.7 ISOTOPIC DISTRIBUTION CHANGES

CAUTION

Perform this section only as directed by the Dose Assessment Supervisor. Isotopic distributions edited in the RDACS "Auto Mode" will automatically change the values on the file server.

NOTE

Each release path can be assigned individual iodine, particulate, and noble gas isotopic distributions. The gross iodine, particulate, and noble gas concentrations measured by the SPINGS for each release path are used to scale these isotopic distributions, resulting in the isotopic release rates used in the offsite dose calculations.

NOTE

The calculated offsite doses can be modified substantially by changes to the isotopic distributions which would appear to be slight.

- 9.7.1 The isotopic distributions for a release pathway should be changed whenever new laboratory data is obtained detailing the relative concentrations of isotopes being discharged via that pathway.
- 9.7.2 Enter data onto the "Isotopic Distribution Worksheet", Form 7.1D of the RDACS Desk Guide, for each affected release pathway for which the isotopic distribution is being revised. Refer to RDACS Desk Guide, Section 2.3.
- 9.7.3 From the RDACS Subsystem Main Menu, select **Option 2, "Enter Plume Update"**.
- 9.7.4 From the Enter Plume Update Menu, select **Option 5, "Isotopic Distribution"**.
- 9.7.5 From the Isotopic Distribution Menu, select **Option 1, "Monitored Points"** for releases occurring from monitored points and isotopic distribution data is available for these points. **Select Option 2, "Unmonitored Points"** for releases occurring from unmonitored points and isotopic distribution data is available for these points.
- 9.7.6 Select the **"Point ID"** for which you wish to change the isotopic distribution by cycling through the active pathways using the **<F3>** key.
- 9.7.7 When the pathway of choice is displayed on the screen, press **<ENTER>**.
- 9.7.8 Press **<F1>** for a menu selection of possible isotopic distribution sources.

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- 9.7.9 Select the appropriate source by pressing the arrow keys to highlight the correct option and press <ENTER> <ENTER>.
- 9.7.10 Enter the sample date and time for the laboratory data you wish to enter followed by <ENTER>.
- 9.7.11 Enter the appropriate isotopic information next to the isotope of choice in $\mu\text{Ci/cc}$.
- 9.7.12 When all data for particulate, iodine and noble gas values have been entered for all monitored release points, press <F2>.
- 9.7.13 The message "Record Updated" should appear at the bottom left of the screen.
- 9.7.14 Press <F10> twice.
- 9.7.15 If in "Auto Mode" the next available plume segment will use the new isotopic distribution information when calculating the next plume segment.
- 9.7.16 If in "Backup Mode" the new isotopic distribution will be used when all data for the next plume segment is entered and that segment is processed.

9.8 DATA TRENDING

- 9.8.1 RDACS has the capability to trend historical or current data.
- 9.8.2 To initiate data trending, select **Option 6, "Data Display"**, from the Gaseous Effluent Monitor Main Menu.
- 9.8.3 When the submenu appears, select **Option 1, "Data Trending"**.
- 9.8.4 Using the <F7> key, select the trend mode desired (i.e., Auto Update or Historical).
- 9.8.5 The user must then enter the appropriate responses to the following:
 - A. TREND NAME - Enter the name that you wish associated with the trended data (8 characters maximum) or blank for an unnamed plot. Press <ENTER>.
 - B. DATA RESOLUTION - A submenu will appear requesting either 2 minute, 10 minute or 60 minute trending. Using the cursor keys, move to the selected time sequence and select <ENTER>.

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- C. POINT ID - Depress the <F1> key to get a listing of possible SPING/meteorological data selections that you desire to trend. As you select your choice, a series of menus will be presented to help you focus-in on your selection. Press <ENTER> and RDACS will display the current value of the trend data requested.
- D. MINIMUM VALUE - Enter the minimum value that you wish your trend to include. If you leave this field blank, this value will be automatically selected. Press <ENTER>.
- E. MAXIMUM VALUE - Enter the maximum value that you wish your trend to include. If you leave this field blank, this value will be automatically selected. Press <ENTER>.
- F. PLOT DATA TIME FRAME - Enter the dates and times that you wish your trend to include. Once entered, depress the <F4> key to obtain or begin obtaining the trend information.

9.8.6 Graphing Trends

- A. From the Point Trend Display screen, select the <F5> key to graph the trend that you desire.
- B. If your trend displays values outside of the minimum and/or maximum fields defined previously, you may perform one of two functions to obtain those values outside of this range as described below:
 1. The user may return to the Trend Display screen and enter new minimum/maximum values to broaden the graphed range.
 2. The user may, once the graph is displayed, use the left or right cursor arrow keys to place a bar on the graph and move this bar to a particular location on the trended data. The value of the point at which the bar is positioned will be displayed by depressing the <F7> key. The user may wish to return to the Trend Display screen at this time and enter new minimum/maximum values.

9.8.7 Saving/Obtaining Trend Data

- A. To save trended data, the user must depress the <F2> key and assign a name to the trended data from the Point Trend Display screen.

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- B. To obtain previously performed trend information, the user must position the blinking cursor in the Point I.D. blue block and depress the <F3> key. Select "Get Trend" and then enter the name of the trend desired. If you want a listing of previously saved trends, depress the <F1> key to get a listing of those trends.

9.9 OBTAINING RDACS DATA FROM THE ALTERNATE EOF

NOTE

In the event evacuation of the EOF to the alternate location is required, the Dose Assessment Supervisor will ensure that an RDACS terminal, modem, and associated printer are relocated to the alternate location.

- 9.9.1 Ensure the RDACS computer is plugged in and connected to the printer and keyboard.
- 9.9.2 Ensure that the RDACS computer is "ON" and in the "Drill" mode.
- 9.9.3 Ensure the toggle switch on the back of the modem is "ON".
- 9.9.4 Ensure that the modem is connected via a telephone line to a telephone jack.
- 9.9.5 Ensure that the cable connections are secure between the modem and the RDACS computer.
- 9.9.6 Ensure that the Gaseous Effluent Monitoring System Main Menu is on the RDACS screen. This is automatic upon turning on the computer.
- 9.9.7 Depress the <ESC> key, then select "Y" to end RDACS session. A "C:\SST>" should appear on the screen.
- 9.9.8 Type TERM, then depress the <Enter> key. This will enter the TERM program and will automatically call the file server. The operator should be able to hear the modem placing the call. If the connection is made, the message "call connected" will appear followed by "login". If this does NOT occur, check connections and hit the <Enter> key to retry.
- 9.9.9 If drill data is desired, the login and password should be, "rlsdrill" and hit <Enter>. (This needs to be done twice for drill data) If live data is desired, the login and password should be, "rlslive" and press <Enter>.
- 9.9.10 Check that the Release Parameters Update screen is correctly drawn. If it appears to contain errors such as column alignment or misplaced data then the screen can be redrawn by <ctrl> <L>.

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- 9.9.11 Depress the <Print Scrn> key. The printer will NOT auto-feed the paper so it will be necessary to press the "on line" key on the printer followed by the "form feed" key and then the "on line" key again to turn the printer back on.
- 9.9.12 Enter <Alt> <Q> and then "Y" to exit TERM. This should automatically return the user to the RDACS Main Menu. If this does not occur, re-boot the computer.
- 9.9.13 Enter data in accordance with section 9.4, RDACS OPERATIONS - BACKUP MODE.

10.0 ATTACHMENTS AND FORMS

10.1 ATTACHMENTS

- 10.1.1 Attachment 1 - Dose Assessment Team Task Guides
 - A. Task Guide A - Initial Dose Assessor
 - B. Task Guide B - Projection Operator/PAR Developer
 - C. Task Guide C - Forecast Operator
 - D. Task Guide D - Map Maker
 - E. Task Guide E - DAS Technical Assistant
 - F. Task Guide F - TSC RDACS Operator
- 10.1.2 Attachment 2 - RDACS System Configuration
- 10.1.3 Attachment 3 - Sigma Theta/Stability Class Comparison
- 10.1.4 Attachment 4 - Typical Stability Classes by Date, Time, and Cloud cover.
- 10.1.5 Attachment 5 - Emergency Classification Criteria

10.2 FORMS

None

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[Dose Assessment Team Task Guides]

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Attachment 1

TASK GUIDE A

[INITIAL DOSE ASSESSOR (IDA)]

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Task Statement: The task of the IDA is to respond to the effected unit's Control Room during emergencies to perform dose assessment calculations and formulate radiological Protective Action Recommendations (PAR), until relieved by DAT. Assist DAT as necessary.

I. Initial Response/Set-up

- A. If notified by the Control Room, report immediately to the Shifty.
- B. Inform the Shifty that you are reporting in and obtain a briefing on current conditions available.
- C. Specifically request that the Shifty notify you of any actual/potential unmonitored release.

II. Duties

A. Immediate Actions

1. Obtain a 1904 procedure and RDACS Desk Guide.
2. Obtain any needed supplies from the emergency kit located in the Unit One Control Room (e. g., pens, pencils, 10-mile EPZ map, calculator, etc.)
3. The IDA's task is to operate the Control Room RDACS computer by acknowledging RDACS alarms/messages, accepting RDACS updates, informing the Shifty of all radiological emergency classifications and formulating radiological Protective Action Recommendations (PARS). Forward all paperwork to the Shifty for review and approval.
4. Ensure the Shifty is informed/updated of emergency classifications generated by the RDACS Reports.
5. Perform a Protective Action Recommendation (PAR) for RDACS updates and forward to the Shifty as quickly as possible.
6. Provide meteorological data to the Shift Engineer as necessary for notifications to the Arkansas Department of Health (ADH).

NOTE

Offsite notifications to the ADH and counties must be made by the Shift Engineer within 15 minutes from the emergency class declaration.

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TASK GUIDE A

[INITIAL DOSE ASSESSOR (IDA)]

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7. The IDA should continue to perform their duties until relieved by the DAT members at the EOF.

B. On Going Actions

1. Monitor all releases using RDACS and keep the Shifty informed of any change in release source or pathway.
2. Continue to acknowledge RDACS alarms/messages and/or accept RDACS update as they are displayed on the RDACS screen.
3. Route all EAL Reports, RDACS Routine Reports, Plume Maps and Protective Action Recommendations (PARS) to the Shifty for review and approval.
4. Obtain a briefing from the Shifty as often as possible to determine whether an unmonitored release is involved or not. Obtain necessary release form information from the RDACS Desk Guide which is located at each RDACS terminal

C. Special Actions to be Implemented as Needed

1. Manually edit RDACS whenever an unmonitored release is occurring.

Caution:

Remember that manually edited data on RDACS must be deleted whenever the release is terminated.

2. Perform dose assessment calculations using the RDACS "Backup Mode" if the "Auto Mode" fails during operations. **Refer to RDACS Desk Guide, Section 2.6, for quick reference info.**
3. If onsite meteorological data is lost, complete the "Atmospheric Stability Class Determination" form. **Refer to RDACS Desk Guide, Section 2.2, for quick reference.**

D. Turnover to the Dose Assessment Team at the EOF

1. When notified, brief the Dose Assessment Supervisor (DAS) of the current release status and report current RDACS update information and any associated Protective Action Recommendations (PARS).
2. Fax any requested data to the DAS using the fax machine in the Control Room. Request assistance as necessary from the Shift Engineer. Fax data to the EOF at 858-6820 or as directed by the DAS.

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TASK GUIDE A

[INITIAL DOSE ASSESSOR (IDA)]

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3. Whenever the DAS notifies you that the EOF is ready to assume the dose assessment responsibility, the Shift Supt. should be notified of this request before official turnover.
4. Remain in the Control Room to assist the DAT members at the EOF, until notified otherwise by the DAS or the Nuclear Chemistry Manager.

E. Actual Event/Drill Termination

1. Collect and organize in chronological order, all of your documents, logs, procedures, supplies, etc., and help restore dose assessment work area in the Control Room.
2. Provide a list of any supplies needing replenishment, to the Shifty.
3. Upon completion of an actual emergency, make copies of Plume Update Report (s) and forward to Nuclear Chemistry for inclusion of emergency radioactive releases into the annual radioactive effluent database.
4. Turn over all documentation generated during the drill/emergency to the Shifty.
5. Participate in the post drill/emergency critique to identify weaknesses and strengths.

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TASK GUIDE B

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[PROJECTION OPERATOR/PAR DEVELOPER]

TASK STATEMENT: The task of the Projection Operator is to operate the EOF RDACS computer by acknowledging RDACS alarms/messages, accepting RDACS updates, formulating PARs, forwarding information to the Map Maker and editing RDACS as necessary during the course of an emergency incident.

I. Initial Response/Setup

- A. When notified of an Emergency Plan activation, report to Room 262 of the EOF.
- B. Notify the Dose Assessment Supervisor (DAS) that you are reporting in as a DAT member and obtain a briefing on current conditions available.
- C. Obtain a 1904.xxx series procedure set from the roll-cart located in the adjacent Room 260.
- D. Obtain the RDACS computer key from the emergency kit keybox located just outside of Room 262. Note: Break the keybox glass if necessary to obtain the key.
- E. Using the RDACS key, unlock both RDACS computers located in Room 262, if not already unlocked.

Caution:

If a monitored release is already in progress, you must wait until you receive a "New Update Available" message before you can begin accepting data.

- F. Turn the power on to both RADCS terminals and sign on in the "Drill Mode" for drills and the "On-Line Mode" for actual emergency conditions.

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TASK GUIDE B

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[PROJECTION OPERATOR/PAR DEVELOPER]

II. **Duties**

A. **Immediate Actions**

NOTE

Perform Steps 1.a through 1.d below only if the Initial Dose Assessor is performing dose assessment on a release already in progress. Otherwise, proceed to Step 2.

1. **Obtaining Information from the Initial Dose Assessor in the Control Room**
 - a. Notify the DAS that you are preparing to contact the Initial Dose Assessor in the affected Control Room. Following this notification, contact the initial dose assessor and obtain a briefing on the current status of dose assessment.

Unit One - Ext. 3102
Unit Two - Ext. 3202
 - b. Determine from the Initial Dose Assessor the status of any release and whether the release is "monitored" or "unmonitored".
 - c. If the release is an unmonitored release, have the Initial Dose Assessor fax the worksheets previously calculated to the EOF Switchboard at 964-6820. **Note:** If the unmonitored release is from a steam release being monitored by the Main Steam Line Monitors, inform the Initial Dose Assessor that you will be requesting monitor readings for the duration of the release.
 - d. If the release is a monitored release, wait until you receive a "New Update Available" message on RDACS before accepting any data.
2. **RDACS Monitoring by the Projection Operator**
 - a. Monitor the RDACS computer and acknowledge all RDACS alarms/messages. Reference Procedure 1904.002, Section 9.2, to perform this task.
 - b. Monitor the RDACS computer and accept all "New Update Available" messages.
 - c. Formulate a PAR for each RDACS update generated and inform the DAS in a timely manner of all PAR results.

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[PROJECTION OPERATOR/PAR DEVELOPER]

- d. Ensure that the DAS is informed of each and every emergency classification generated by the RDACS EAL Reports and/or RDACS Routine Report.
- e. Locate those sections of the dose assessment procedures that apply to the accident situation.
- f. Obtain any necessary forms needed from the RDACS Desk Guide, located at the RDACS terminals.
- g. Once data is generated on the RDACS, ensure that the "RDACS/Field Data Comparison Sheet" and the associated plume map are forwarded to the Map Maker as quickly as possible.
- h. Ensure that two copies of the RDACS Routine Report and PARs are printed (i.e. one copy for the DAS and another copy for the REAM).

B. On Going Actions

1. Monitor all releases and keep the DAS informed of any change in release source or pathway.
2. Continue to accept data and generate reports and PARs on the timeline outlined by the DAS. For ongoing releases, a 30 minute update interval will be the standard.
3. Ensure that the "RDACS/Field Data Comparison Sheet" and plume maps are forwarded to the Map Maker as soon as they are available.

C. Special Actions to be Implemented as Needed

1. When requested, obtain required meteorological data for the EOF Notifications Communicator.
2. Manually edit the RDACS whenever an unmonitored release is occurring.
3. Perform dose assessment calculations using the RDACS "Backup Mode" if the RDACS "Auto Mode" fails during operations.
4. Edit the RDACS to adjust for field team data as directed by the DAS.
5. Edit the RDACS to adjust for isotopic distribution as directed by the DAS.

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[PROJECTION OPERATOR/PAR DEVELOPER]

D. Shift Change

1. Upon arrival of your shift replacement, turn over all pertinent documents, forms, and supplies.
2. Brief your replacement on the current radiological classification, status of any release and any other information specific to the emergency situation that you have been involved with.

E. Actual Event/Drill Termination

1. Collect and organize in chronological order all of your documents, logs, procedures, supplies, etc., and help restore the dose assessment area.
2. Provide a list of any forms or supplies needing replenishment to Emergency Planning.
3. Upon completion of an actual Emergency make copies of Plume Update Report(s) and forward them to Nuclear Chemistry for inclusion of emergency radioactive releases into the annual radioactive effluent database.
4. Turn over all documentation generated during the drill/emergency to Emergency Planning.
5. Participate in the post drill/emergency critique to identify weaknesses and strengths.

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[FORECAST OPERATOR]

TASK STATEMENT: The task of the Forecast Operator is to obtain a weather forecast and perform RDACS trending and forecasting as requested by the DAS and obtain backup meteorological data should the onsite met tower fail.

I. Initial Response/Setup

- A. When notified of an Emergency Plan activation, report to Room 262 of the EOF.
- B. Notify the Dose Assessment Supervisor (DAS) that you are reporting in as a DAT member and obtain a briefing on current conditions available.
- C. Obtain a 1904.xxx series procedure set from the roll-cart located in the adjacent Room 260.
- D. If the RDACS computers in Room 262 are not yet unlocked, obtain the RDACS computer key from the emergency kit keybox located just outside of Room 262 and unlock both RDACS computers. Note: Break the keybox glass if necessary to obtain the key.

II. Duties

A. Immediate Actions

- 1. Obtain area weather forecast in accordance with procedure 1904.002, step 9.3.1.
- 2. Retain the weather forecast printout for future use.

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FORECAST OPERATOR TASK GUIDE

B. On Going Actions

1. As time allows, assist the Projection Operator by keeping the additional RDACS computer up-to-date by acknowledging alarms and accepting updates as required.
2. Perform trending on RDACS as requested by the DAS.

C. Special Actions to be Implemented as Needed

1. If onsite meteorological data is lost, refer to RDACS Desk Guide, Section 2.2, for determining stability class. Forward this information to the Projection Operator as quickly as possible.
2. As directed by the DAS, perform a dose assessment forecast projection on the RDACS "Forecast Mode" by completing the "Forecasting Worksheet". Reference the RDACS Desk Guide, Section 2.5 and Section 9.3.3 of this procedure.

D. Shift Change

1. Upon arrival of your shift replacement, turn over all pertinent documents, forms, and supplies.
2. Brief your replacement on the current radiological classification, status of any release and any other information specific to the emergency situation that you have been involved with.

E. Actual Event/Drill Termination

1. Collect and organize in chronological order all of your documents, logs, procedures, supplies, etc., and help restore the dose assessment area.
2. Provide a list of any forms or supplies needing replenishment to Emergency Planning.
3. Turn over all documentation generated during the drill/ emergency to Emergency Planning.
4. Participate in the post drill/emergency critique to identify weaknesses and strengths.

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[MAP MAKER]

TASK STATEMENT: The task of the Map Maker is to draw plume maps, using the RDACS plume map printout, onto laminated 10-mile EPZ maps. Additionally, the map maker is also responsible for obtaining the RDACS/Field Data Comparison Sheet and attaching this data to completed EPZ maps. Paperwork generated by the DAT should be organized and archived by the Map Maker.

I. Initial Response/Setup

1. When notified of an Emergency Plan activation, report to Room 262 of the EOF.
2. Notify the Dose Assessment Supervisor (DAS) that you are reporting in as a DAT member and obtain a briefing on current conditions available.
3. Obtain the laminated 10-mile EPZ maps located next to the Emergency Kit just inside the door of Room 260. Note: Non-laminated 1 and 10 mile EPZ maps are also available in the dose assessment emergency kit.
4. Obtain the form file box located in the dose assessment emergency kit and place the box on the tables located in the middle of Room 262.
5. Obtain markers from the dose assessment supply box for use in drawing maps.

II. Duties

A. Immediate Actions

1. Prepare an initial map to be forwarded to the REAM as quickly as possible:
 - a. Obtain the meteorological data from the Projection Operator, record this information on a laminated 10-mile EPZ map under the comments section.
 - b. Draw an arrow on the laminated map in the downwind direction and forward the map to the DAS.
2. Obtain another laminated map and be prepared to draw a map and complete an RDACS/Field Data Comparison Sheet (located on the RDACS Routine Report) as information is available from the Projection Operator.

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[MAP MAKER]

3. Using the RDACS plume map, draw an outline of the plume onto the laminated 10-mile EPZ map. DO NOT color-in the inner portion of the plume.
4. Before forwarding the completed map to the DAS, check with the DAS Technical Assistant and record any field data dose measurements that are available onto the RDACS/Field Data Comparison Sheet.
5. Forward the completed map to the DAS for review.

B. On Going Actions

1. Complete Steps 2 through 5 above as update information is available or on a time interval prescribed by the DAS.
2. Clean previously completed maps as they are returned from the REAM so that they may be used when needed.
3. Archive the paperwork generated by the DAT (i.e., RDACS Routine Reports, PAR Projections and other miscellaneous dose assessment forms) by plume update number once they are reviewed by the DAS.

C. Shift Change

1. Upon arrival of your shift replacement, turn over all pertinent documents, forms, and supplies.
2. Brief your replacement on the current radiological classification, status of any release and any other information specific to the emergency situation that you have been involved with.

D. Actual Event/Drill Termination

1. Collect and organize in chronological order all of your documents, logs, procedures, supplies, etc., and help restore the dose assessment area.
2. Provide a list of any forms or supplies needing replenishment to Emergency Planning.
3. Turn over all documentation generated during the drill/emergency to Emergency Planning.
4. Participate in the post drill/emergency critique to identify weaknesses and strengths.

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[DAS TECHNICAL ASSISTANT]

TASK STATEMENT: The task of the DAS Technical Assistant is to assist the DAS and the DAT in performing miscellaneous tasks as requested by the DAS. The DAS Technical Assistant is responsible for ensuring that field data received by the Offsite Monitoring Supv. is transferred to the Map Maker and that RDACS Desk Guide Form 7.1B (Dose Scale Factor Worksheet) is completed as necessary when variances occur between field data and RDACS projected data.

I. Initial Response/Setup

- A. When notified of an Emergency Plan activation, report to Room 262 of the EOF.
- B. Notify the Dose Assessment Supervisor (DAS) that you are reporting in as a DAT member and obtain a briefing on current conditions available.
- C. Obtain a notebook pad and pen/pencil from the dose assessment supply box located on the Map Maker's table or within the dose assessment emergency kit.

II. Duties

A. Immediate Actions

- 1. Locate the Offsite Monitoring Supervisor (OMS), stationed in the adjacent Room 264, and inform him that you will be the DAT contact for obtaining field team data as it is received.
- 2. Inform the Map Maker that you will be forwarding field team data as it is received from the OMS.
- 3. Refer to RDACS Desk Guide, Section 2.4, for completing the "Dose Scale Factor Worksheet". This worksheet will be completed whenever RDACS and field team data begin to differ significantly and as directed by the DAS.
- 4. As directed by the DAS, forward completed scale factor calculations to the Projection Operator for RDACS editing.
- 5. Assist the DAS in communicating with various ERO personnel as needed. Refer to the Emergency Telephone Directory as needed in making necessary communications (Emergency Telephone Directories are located in the dose assessment emergency kit).

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[DAS TECHNICAL ASSISTANT]

B. On Going Actions

1. Obtain and forward all field team data to the Map Maker.
2. Complete "Dose Scale Factor worksheet" as outlined in Step 3 above.
3. Assist the DAS as requested.
4. Assist the DAT members as time allows in obtaining information and completing dose assessment forms.

C. Shift Change

1. Upon arrival of your shift replacement, turn over all pertinent documents, forms, and supplies.
2. Brief your replacement on the current radiological classification, status of any release and any other information specific to the emergency situation that you have been involved with.

D. Actual Event/Drill Termination

1. Collect and organize in chronological order all of your documents, logs, procedures, supplies, etc., and help restore the dose assessment area.
2. Provide a list of any forms or supplies needing replenishment to Emergency Planning.
3. Turn over all documentation generated during the drill/emergency to Emergency Planning.
4. Participate in the post drill/emergency critique to identify weaknesses and strengths.

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[TSC RDACS OPERATOR]

TASK STATEMENT: The task of the TSC RDACS Operator is to ensure that the TSC RDACS computer is kept up-to-date by acknowledging RDACS alarms/messages and accepting updates. Trending of release data should also be performed to give the TSC staff indications of how well mitigation efforts to terminate the release are working. The TSC RDACS Operator will report to the Radiation Protection and Radwaste (RP&RW) Manager in the TSC.

NOTE

The TSC RDACS Operator is not responsible for editing RDACS or for printing data in the TSC.

I. **Initial Response/Setup**

- A. When notified of an Emergency Plan activation, report to the TSC located on the 3rd floor of the ANO Administration Building.
- B. Notify the Radiation Protection and Radwaste (RP&RW) Manager located in the TSC that you are reporting in as the TSC RDACS Operator.
- C. Obtain a 1904.xxx series procedure set from the TSC Procedure Bookcase.
- D. Ensure that the RDACS computer in the TSC is unlocked. If the computer is still locked, obtain the RDACS computer key from the emergency keybox located on the front of the emergency kit in the TSC Switchboard room within the TSC.
- E. Power the RDACS computer up and sign on in either the "Offline Drill Mode" during drills or the "Online Live Mode" for actual emergency conditions.

II. **Duties**

A. **Immediate Actions**

- 1. Monitor the RDACS and acknowledge RDACS alarms and messages as they appear on the screen. Reference Section 9.2 of this procedure, to perform this task.

Caution:

Do not try to accept any RDACS update until you have received a "New Update Available" message.

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[TSC RDACS OPERATOR]

2. Accept "New Update Available" messages as they appear on the screen and display the most current plume map on the screen for TSC personnel review. Reference Section 9.2 of this procedure to perform this task.
3. Keep the RP&RW Manager informed of the release status (e.g., release pathway).

Note: If an unmonitored release is involved, remember that RDACS will not display information until the Initial Dose Assessor or the Dose Assessment Team has manually edited RDACS. Contact the Dose Assessment Supervisor at ext. 7875/7876 to obtain information on the status of unmonitored releases.

4. If a monitored release is involved (i.e., from a SPING) trend the release on the TSC RDACS computer for the TSC staff review. (See Section 9.8 of this procedure). Note: This will become an important tool for the TSC personnel especially whenever repair efforts are underway to terminate the release.

B. On Going Actions

1. Continue to keep the RDACS computer up-to-date by acknowledging RDACS alarms and messages and accepting RDACS updates as they become available.
2. Keep the RP&RW Manager informed of the release status.
3. Trend SPING data as requested.
4. Display the most current plume on the RDACS screen when not performing trending functions.

C. Shift Change

1. Upon arrival of your shift replacement, turn over all pertinent documents, forms, and supplies.
2. Brief your replacement on the current radiological classification, status of any release and any other information specific to the emergency situation that you have been involved with.

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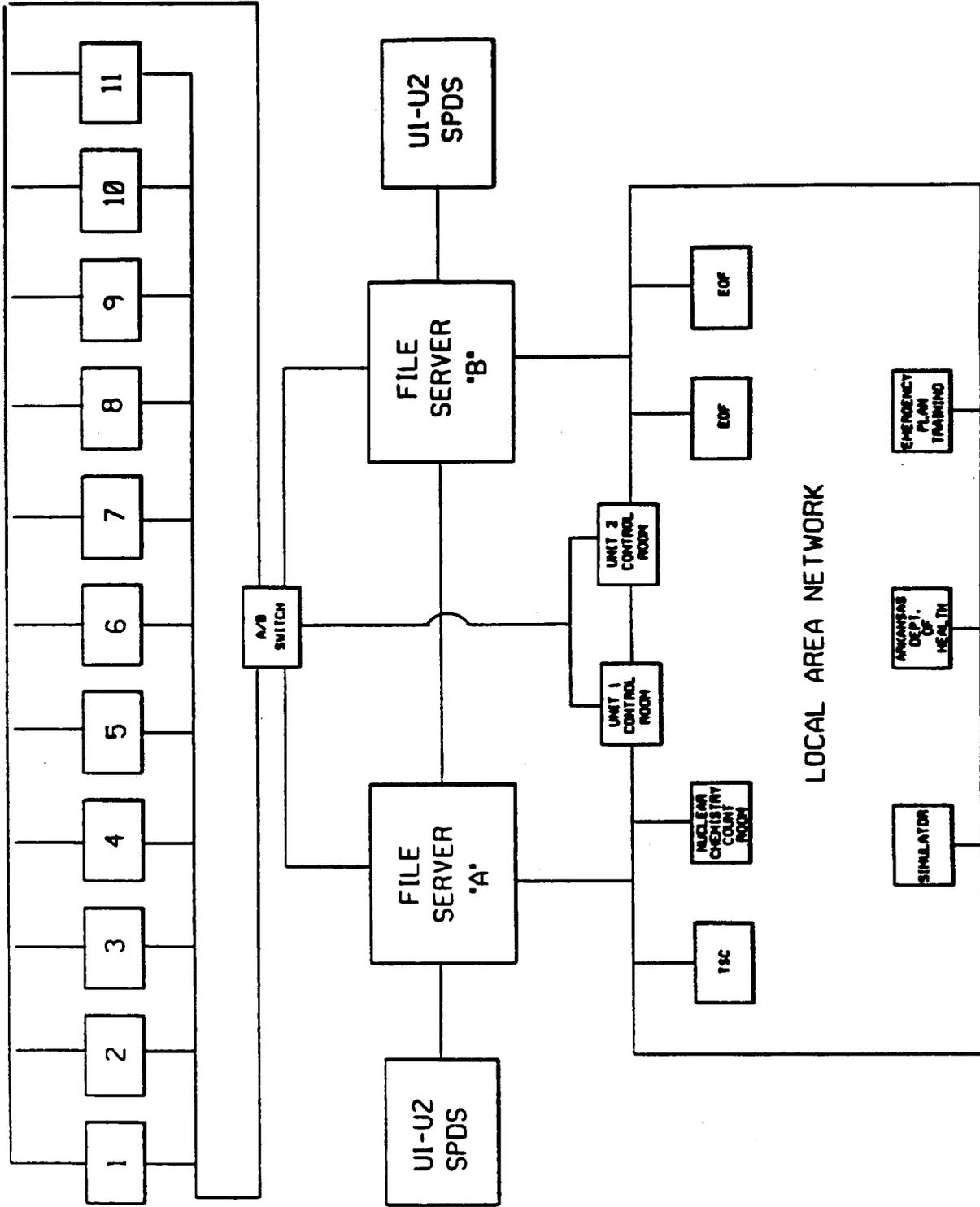
[TSC RDACS OPERATOR]

D. Actual Event/Drill Termination

1. Collect and organize in chronological order all of your documents, logs, procedures, supplies, etc., and help restore the dose assessment area.
2. Provide a list of any forms or supplies needing replenishment to Emergency Planning.
3. Turn over all documentation generated during the drill/emergency to Emergency Planning.
4. Participate in the post drill/emergency critique to identify weaknesses and strengths.

Attachment 2

RDACS SYSTEM CONFIGURATION



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Attachment 3

SIGMA THETA/STABILITY CLASS COMPARISON

<u>Stability Class</u>	<u>Sigma Theta Range</u>	<u>Sigma Theta*</u>
A	----- 22.5 to 30	26.3
B	----- 17.5 to 22.4	20.0
C	----- 12.5 to 17.4	15.0
D	----- 7.5 to 12.4	10.0
E	----- 3.8 to 7.4	5.6
F	----- 2.1 to 3.7	2.4
G	----- less than 2.1	1.0

* Sigma Theta value to be used to convert from Sigma Theta letter designation to Sigma Theta number designation.

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Attachment 4

TYPICAL STABILITY CLASSES BY DATE, TIME, AND CLOUD COVER

STANDARD TIME FRAME	Feb. 16 - Apr. 22 and Aug. 23 - Oct. 25		Apr. 23 - Aug. 22		Oct. 26 - Feb. 15	
	CLEAR	PARTLY CLOUDY	CLEAR	PARTLY CLOUDY	CLEAR	PARTLY CLOUDY
	Midnite - 1:00	F	E	F	E	F
1:00 - 2:00	F	E	F	E	F	E
2:00 - 3:00	F	E	F	E	F	E
3:00 - 4:00	F	E	F	E	F	E
4:00 - 5:00	F	E	F	E	F	E
5:00 - 6:00	F	E	F	E	F	E
6:00 - 7:00	D	D	D	D	F	E
7:00 - 8:00	D	D	C	D	D	D
8:00 - 9:00	C	D	B	C	D	D
9:00 - 10:00	B	C	B	C	C	D
10:00 - 11:00	B	C	B	C	C	D
11:00 - Noon	B	C	B	B	C	C
Noon - 13:00	B	C	B	B	B	D
13:00 - 14:00	B	C	B	B	C	D
14:00 - 15:00	B	C	B	C	C	D
15:00 - 16:00	C	C	B	C	C	D
16:00 - 17:00	D	D	B	C	D	D
17:00 - 18:00	D	D	C	D	D	D
18:00 - 19:00	D	D	D	D	F	E
19:00 - 20:00	F	E	F	E	F	E
20:00 - 21:00	F	E	F	E	F	E
21:00 - 22:00	F	E	F	E	F	E
22:00 - 23:00	F	E	F	E	F	E
23:00 - Midnite	F	E	F	E	F	E

NOTE

For overcast (OVC.) conditions, the stability class typically is "D" at all hours and seasons

This stability class chart is based on Standard Time. During Daylight (Example - If it is 1000 hours and Daylight Savings Time is currently being used, you must read the chart above in the 9:00-10:00 range.)

Savings Time runs from the first Sunday in April to the last Sunday in October.

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Attachment 5

EMERGENCY CLASSIFICATION CRITERIA

There are four emergency classes which have been defined by the NRC: Notification of Unusual Event (NUE), Alert, Site Area Emergency (SAE), and General Emergency (GE).

Emergency Classes may be defined by either plant operational conditions (Emergency Action Levels (EALs) as listed in 1903.010) or radiological conditions (using RDACS and/or field data measurements). Likewise, Protective Action Recommendations (PARs) are either based on plant operational conditions or on radiological criteria. Procedure 1903.011 discusses the PARs that may be issued based on plant conditions and/or radiological PARs that are determined by trained dose assessment personnel (using RDACS and/or field measurements).

RDACS will automatically determine an appropriate emergency class whenever certain radiological criteria has been exceeded. Unmonitored releases will require manual input from an RDACS operator in order for adequate classification to occur on RDACS.

NOTE: EAL Reports are displayed on RDACS for both the NUE and Alert classifications. Emergency Dose Calculations (EDC) will begin whenever any of the following conditions are met:

- 1) The Emergency Class limits are exceeded for an instantaneous (2 minute) period dose rate.
- 2) The Emergency Class limits are exceeded for the rolling hourly average dose rate.
- 3) 75% of the Emergency Class limits are exceeded for the rolling hourly average dose rate.

Once EDC begins, EAL reports are no longer generated, but a new RDACS report and plume map will be available every 10 minutes on RDACS until the event is terminated.

RDACS uses the following methods and limits to determine the appropriate Emergency Class:

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Attachment 5

Emergency Classification

Emergency Class	TEDE dose rate at site boundary	Child Thyroid dose rate at site boundary	X/Q used in Emergency class calc.	Data file used for Emergency class determination
NUE	>0.05 mrem/hr	>0.15 mrem/hr	Avg. annual	Rolling hourly avg. updated every 2 mins.
Alert	>0.50 mrem/hr	>1.5 mrem/hr	Avg. annual	Rolling hourly avg. updated every 2 mins.
SAE	>50 mrem/hr	>150 mrem/hr	Actual at site boundary	10 min avg. Met and Rad data used.
GE	>250 mrem/hr	>500 mrem/hr	Actual at site boundary	10 min avg. Met and Rad data used.