



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

January 8, 2001

10 CFR 50,  
Appendix E  
Section V

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos.	50-259	50-390
Tennessee Valley Authority	)		50-260	50-391
			50-296	50-327
				50-328

TVA CENTRAL EMERGENCY CONTROL CENTER (CECC) - EMERGENCY PLAN  
IMPLEMENTING PROCEDURE (EPIP) REVISIONS

In accordance with the requirements of 10 CFR Part 50, Appendix E, Section V, enclosed are copies of the Effective Page Listing and revisions to CECC EPIPs.

PROCEDURE		EFFECTIVE DATE
EPIP	EPL	12/27/00
EPIP-9	Rev. 22	12/27/00

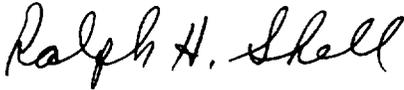
The enclosed information is being sent by certified mail. The signed receipt signifies that you have received this information and will be taken as verification that the NRC copies of the plan have been updated, and the superseded material has been destroyed.

ACYS

U.S. Nuclear Regulatory Commission  
Page 2  
January 8, 2001

If you have any questions, please contact Terry Knuettel at  
(423) 751-6673.

Sincerely,



<sup>to</sup> Mark J. Burzynski  
Manager  
Nuclear Licensing

Enclosures

cc (Enclosures):

U.S. Nuclear Regulatory Commission (Enclosures 2)  
Region II  
Atlanta Federal Center  
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NRC Senior Resident Inspector [Enclosures provided  
Browns Ferry Nuclear Plant by site DCRM]  
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NRC Senior Resident Inspector [Enclosures provided  
Sequoyah Nuclear Plant by site DCRM]  
2600 Igou Ferry Road  
Soddy Daisy, Tennessee 37379-3624

NRC Senior Resident Inspector [No enclosures, by request  
Watts Bar Nuclear Plant of site resident]  
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TENNESSEE VALLEY AUTHORITY  
 CENTRAL EMERGENCY CONTROL CENTER EMERGENCY PLAN  
 IMPLEMENTING PROCEDURES  
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This list of effective pages must be retained with the CECC-EIPs.

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EMERGENCY ENVIRONMENTAL RADIOLOGICAL MONITORING PROCEDURES  
REVISION LOG

Rev. No.	Date	Revised Pages
0	3/22/88	All (Changed from IPD to EPIP)
1	07/08/88	Pages 1 & 2, Page 3 of App. E, Page 4 of App. G, Page 3 of App. I
2	4/26/89	All
3	5/15/90	All
4	07/02/90	1, 2, 5, Att. A, pg. 1; Added Att. R (pgs. 1-4)
5	11/09/90	Pages 4 & 5
6	12/11/90	Page 4 (only)
7	03/25/91	All (*Title changed)
8	10/25/91	All
9	5/15/92	All
10	11/25/92	All pages revised to issue instructions for use of new scalers which are being placed in the environmental monitoring vans.
11	06/15/93	Pages 4, 5, 9; Att. I, pg. 1; Att. J, pg. 1; Att. K; pg. 1; Att. M, pg. 1, Att. Q, pg. 1; Att. R, pg. 2; all other pages reissued.
12	11/09/93	2-8; 10-11; Att. A, pg. 1-4; Att. B, pgs. 1-5; Att. C, pg. 1; Att. D, pg. 1; Att. E, pg. 1; Att. F, pg. 1, 3; Att. G, pg. 1; Att. I, pg. 1; Att. L, pgs. 1-4; Att. M, pg. 1; Att. N, pg. 2; Att. O, pg. 1; Att. Q, pg. 1; Att. R, pgs. 1-2, 5.
13	11/30/93	Pgs. 1, 4-8, 10-13; Att. A, pg. 4; Att. G, pg. 1; Att. H, pgs. 1-2; Att. I, pg. 1; Att. J, pg. 1; Att. K, pg. 1; Att. L, pg. 4; Att. M, pg. 1; Att. O, pg. 1; Att. S, pgs. 1-2.
14	11/22/94	All
15	05/23/95	All
16	01/04/96	Procedure issued in new format which included in some cases altering the order of statements, editorial changes, and addition of boxes and shading to high light of statements. Additional updating was performed on pages 3, 4, 5, 7, 12, 14, 16, 17, 19, 21, 22, 23, 36. All pages issued.
17	12/9/96	1-4, 6-11, 13-19, 21-25, 28-30, 32-39. Changes per annual review. All pages issued.
18	12/23/97	7, 12, 15, 23, 25, 30, 34, 35 and 36. Update map rev. level, update telephone number, update air sampler instructions, update Barium source chart, change field team form so social security numbers are not read over the radio, update inventory checklists. All pages issued.

CECC-EPIP-9  
EMERGENCY ENVIRONMENTAL RADIOLOGICAL MONITORING PROCEDURES  
REVISION LOG

Rev. No.	Date	Revised Pages
19	10/27/98	Delete references to TAC backup radios, area code changes, delete reference to BLN HP radio transmitters, revise air sampler operation instructions, add reference for Iodine concentration, revise sample parameters for soil and snow samples, revise air sampling instructions, add statement for van crew to take any attendant respirator eye ware, update Ba-133 check source table, clarify items for RMCC and courier kits. All pages issued.
20	12/21/99	Change "Attachments" to "Appendix". Update Ba-133 check source decay charts. Editorial changes. All pages issued.
21	6/15/00	Annual review, editorial changes, remove reference to BLN repeaters, remove requirement to keep copy of latest inventory check in vans, indicate new packaging for KI remove reference to second Bicon Analyst/Nal set.
22	12/27/00	Update Barium Source Activity Chart on page 23. All pages issued.

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Appendix C:	Scaler Set-Up
Appendix D:	Dose Log
Appendix E:	Emergency Authorizations
Appendix F:	Dose Rate Measurements
Appendix G:	Air Sample Data Form
Appendix H:	Terrestrial and Fixed Monitor Samples
Appendix I:	Environs Monitoring Record
Appendix J:	Monitoring Team Vehicle Inventory
Appendix K:	WARL Screening Van Inventory
Appendix L:	Field Coordinator Kit Inventory
Appendix M:	Courier Kit Inventory

### 1.0 PURPOSE

This procedure describes environmental radiological monitoring during or after an emergency at a TVA nuclear facility.

### 2.0 SCOPE

This procedure provides instruction for environmental monitoring under the direction of the plant Radiological Control (RADCON) staff, the Central Emergency Control Center (CECC) or the Radiological Monitoring Control Center (RMCC). Checklists and instructions for the inspection, inventory and use of field equipment are also included within this procedure. Several sequences or options may be used to obtain the same results with equipment operation or sampling techniques. Only one method will be discussed in this procedure.

### 3.0 ACTIVATION

OPTIONAL: At an Alert or Unusual Event classification.

MANDATORY: At a Site Area Emergency or General Emergency unless directed otherwise by the Site Emergency Director.

#### 3.1 Command and Control

As emergency response facilities become operational, command and control shall progress from the Site RADCON staff to the CECC and RMCC. The CECC Environs Assessor has responsibility for control of environmental monitoring efforts.

Since the time of operational status of facilities may vary, instructions may generically refer to "Field Control".

#### 3.2 Site RADCON staff

- Shift Supervisor to dispatch Environs Monitoring Teams using **Appendix A**.
- Record field data on **Appendix I**.

A quick reference Table of Contents is provided at the front of this procedure for detailed instruction on emergency authorizations, dose control and field monitoring strategies and priorities.

Ensure that any DOSE RATE or AIR ACTIVITY survey results are PROMPTLY reported to assist in determining emergency classification levels by the Site Emergency Director. Report survey locations as a distance and direction.

Anticipate contact by the CECC Environs Assessor to coordinate a turnover of field control. The transfer of control should be announced on the radio. Thereafter, contact with all field team personnel should be routed through Field Control to avoid conflict of assignments.

3.3. **Environs Assessor (EA) & Field Coordinator (FC)**

- Activate per CECC EPIP-7 if not already done.
- Record field data on **Appendix I**.

A quick reference Table of Contents is provided at the front of this procedure for detailed instruction on emergency authorizations, dose control and field monitoring strategy and priorities.

Ensure that any DOSE RATE or AIR ACTIVITY survey results are PROMPTLY reported for considerations on declaration of emergency classification levels by the Site Emergency Director. Report survey locations as a distance and direction.

If reporting to a RMCC obtain a FC kit from the CECC. Ask CECC Emergency Preparedness staff if other equipment needs to be taken to the RMCC (fax, etc.).

BFN RMCC = Morgan County Courthouse basement, Decatur, AL  
SQN RMCC = Air National Guard Armory, Lovell Field, Chatt., TN  
WBN RMCC = TEMA Operations Center, Alcoa, TN

Upon arrival at the RMCC, establish TVA phone, radio and fax machine communication.

Ensure other field monitoring support staff are adequately briefed on their expected roles (Courier, Fixed Monitor Retrievers, Field Support).

Direction and control of all field operations shall be limited to one individual on the radio.

3.4 **Environs Monitoring Teams**

- Activate per **Appendix B**.
- Record field data on **Appendixes F** (dose rates), **G** (air) and **H** (terrestrial).

Use column heading numbers for communication of data. Report survey locations as a distance and direction, and if applicable, the sample point. Command centers need distance and direction for decision logic.

A quick reference Table of Contents is provided at the front of this procedure for detailed instruction on radiological protection, equipment operation and sampling techniques.

**3.5 Screening Van team**

Obtain dosimeters (TLD and 200 mrem self-reading dosimeter). Prepare the vehicle for departure according to WARL procedures. Establish radio contact with the field team control to ascertain team member dose information and obtain assignment.

**3.6. Courier**

Couriers transport radioactive samples or deliver personnel, supplies and equipment. Courier personnel shall be familiar with concepts for basic radiation protection. The Courier should avoid plumes or radioactivity contaminated areas due to interface requirements outside the affected area, but may do so at the discretion of Field Control.

Obtain a radio equipped vehicle, Courier Kit, sample transport containers and any spare radiological survey instruments (provided by Corporate Emergency Preparedness).

Obtain briefing from the Environs Assessor or Field Coordinator.

Review the Courier Kit Inventory list (**Appendix M**), and wear the supplied dosimeters (TLD and 200 mrem self-reading dosimeter). Re-zero as necessary.

A quick reference Table of Contents is provided at the front of this procedure for detailed instructions (emergency phone numbers, inventory lists and operation of equipment).

Upon arrival at the vehicle, establish radio contact with the CECC Environs Assessor or RMCC Field Coordinator.

Obtain the appropriate maps and sample point description book from the Courier Kit for ready reference.

**3.7. Fixed Monitor Retrievers**

Fixed Monitor Retrievers collect specific samples and environmental TLDs as requested by Field Control. Their duties are similar to non-emergency responsibilities.

Obtain job-specific supplies and equipment and establish communication with the Environs Assessor/Field Coordinator.

Refer to Table of Contents (front of procedure) for detailed instruction on emergency authorizations, dose control and field monitoring techniques and equipment operation.

#### 4.0 FIELD OPERATIONS

##### 4.1 Priorities

During the early phases of a radiological emergency when protective actions must be initiated quickly to be effective, environmental measurements used to calculate the inhalation dose commitment rate to the thyroid and the total body external gamma dose rates to the general public are the most important.

Knowledge of radiological conditions at the site boundary and at distances 2 and 5 miles out from the plant are critical for decisions on emergency classifications and for Protective Action Recommendations to the State.

Environs Monitoring Teams shall perform their tasks according to the following priorities unless directed otherwise by Field Control:

1. The first team to activate shall promptly obtain dose rate measurements along the designated site boundary (see 2 mile map) to obtain site boundary survey prior to scaler set-up.
2. Upon detection of plume immersion, collect and analyze an air sample for radioiodine and particulates at estimated plume centerline.
3. The second team to activate shall focus on locating the (offsite) touchdown point of the plume and collect air samples for analyses.
4. As additional teams become available, dispatch to the opposite side of the river should be considered for the contingency of (near plant) wind shifts and the travel time required.
5. Send air filter media to the screening van or WARL for further analyses as directed by Field Control.

##### 4.2 Plume Tracking and Survey

When directed by Field Control, Environs Monitoring Teams shall traverse along the assigned route to locate the plume. Travel at approximately 20 mph (during drills, simulate reduced speed as necessary to avoid traffic hazards). Practice safe vehicle operation with attention to height limitations, safe roadside pull-offs and parking, accessing private property and use of the warning strobe lights. Secure cabinets, lead shields, and personnel seat belts prior to vehicle movement.

Monitor the survey meters (open and closed beta shields) to determine plume immersion versus shine.

- Record and report data per **Appendix F**.

Report "Plume Traverse" readings at the estimated PLUME CENTERLINE. If instructed to survey plume edge, report EDGE. If the centerline cannot be determined (i.e., if required to turn back with rates still increasing), report plume location as UNKNOWN.

**NOTE:** If less than 2 mrem/hr, report Geiger-Mueller Survey Meter (GMSM) measurements. If greater than or equal to 2 mrem/hr, use measurements from the Ion Chamber Survey Meters (ISM).

If plume immersion is suspected, the following ALARA practices are recommended if surveys are requested: (1) stop vehicle and obtain ISM "Plume Traverse" measurements by placing the meter against the opened air sampling portal, (2) obtain "Near Ground" surveys by use of the rear air lock exit.

#### 4.3 Sample Point Maps (latest revision levels)

BFN 2 Mile	Rev. 2, 1 July 1994	WBN 2 Mile	Rev. 2, October 1997
BFN 10 Mile	Rev. 2, 16 May 1994	WBN 10 Mile	Rev. 1, 20 May 1993
BFN 50 Mile	Rev. 2, 1 July 1994	WBN 50 Mile	Rev. 2, 30 August 1993
SQN 2 Mile	Rev. 1, 16 December 1994		
SQN 10 Mile	Rev. 1, 1 February 1994		
SQN 50 Mile	Rev. 1, 30 June 1991		

#### 4.4 Radio Protocol

**NOTE:** During drills or exercises, all personnel should state "THIS IS A DRILL" when transmitting simulated radiological or plant accident conditions, or other information which may cause public concern if it were monitored. Use of "repeat-back's" and phonetic alphabets are recommended

Maintain communication with field team control according to the following sequence. Use the vehicle's external speaker during exits.

1. Motorola mobile radio (with repeater activated frequencies)
2. Cellular phone
3. Leave area of hazard and contact by public phone

The following call signs are designated for field operations:

##### Base Stations

CECC  
"Site" TSC  
"Site" Plant Lab  
RMCC

##### Mobile Units

Truck # (Monitoring vehicle)  
Screening Van  
Courier  
Portable # (misc.)

#### 4.5 Routine Dose Control

The dose of personnel during emergency operations shall be maintained As Low As Reasonably Achievable (ALARA).

**CAUTION!:** Personnel should be aware of potential rapidly changing conditions.

For purposes of this implementing procedure, radiation exposure as expressed in units of R and subunits, thereof, is equivalent to dose (rad) and dose equivalent (rem) based on ANSI N 13.11 development and terminology. Any acute dose greater than 10 rem is generally denoted in units of rad, since that level is considered as the accident range of personnel exposure. Any dose less than that level is considered the protective range of personnel exposure. For purposes of this procedure the assumption of 1 rad = 1 rem is assumed for all levels of exposure.

Field personnel shall report their self-reading dosimeter readings to Field Control at approximately every 100 mrem increment and record doses on **Appendix D**.

Until isotopic assessments of airborne radioactivity are available, the CECC Environs Assessor shall apply an administrative correction factor of 2 to estimate TEDE doses in airborne radioactivity areas:

$$\text{Estimated TEDE} = \text{dosimeter reading} \times 2$$

When accident specific radionuclide assessments are available, dose assessment activities should be performed to adjust the correction factors.

Personnel shall advise Field Control when TEDE doses (including pre-emergency doses) approach their individual dose limits. Limits used for declared REP emergency events are based on 10 CFR 20, versus TVA administrative levels. Perform this notification early enough to allow exit from the area prior to exceeding any limits, if higher doses are not authorized.

- Dose limits are to be listed on **Appendix D**.

- Take protective actions listed in **Appendixes F, G and I**.

The Environs Assessor shall coordinate appropriate post exposure dose assessments for field personnel.

#### 4.6 Emergency Dose Limits

The dose of personnel during emergency operations shall be maintained As Low As Reasonably Achievable (ALARA). If circumstances require field personnel to remain in a radiologically hazardous area, higher whole body dose limits may be authorized. Any decisions to embark on emergency operations which would result in doses in excess of 10 CFR 20 should be done in consultation with the most senior member of RADCON who is available on a timely basis.

##### **Emergency Dose Authorizations**

- The SED authorizes if field teams are under control of the site.
- The CECC RAM authorizes if teams are under the control of the CECC (The RAM shall inform the CECC Director and TSC RADCON Manager)
- Document authorization and acceptance of emergency dose on **Appendix E**.

Receipt of emergency dose above normal limits shall be on a voluntary basis. Other factors being equal, older volunteers should be selected first. In addition, selection of female volunteers capable of reproduction should be avoided if other volunteers are available.

The use of respiratory protection equipment and protective clothing should be considered to minimize personnel contamination. Personnel shall not enter any area where dose rates are unmeasurable with instruments and dosimetry (i.e., offscale high reading).

Personnel receiving emergency doses shall be informed of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred, and numerical estimates of the risk of delayed effects. Recipients shall acknowledge review of this information (located on Appendix E, page 2 of 2) by signature on **Appendix E**. Dose under these conditions shall be limited to once in a lifetime.

For Lifesaving or Protection of Large Populations the limit is 25 rad TEDE, (when lower dose is not practicable). In this situation, the limit for lens of eye is 75 rad, or three (3) times the TEDE value. The limit for any other organ (including skin and body extremities) is 250 rad, or ten (10) times the TEDE value.

**NOTE:** Situations may occur in which a dose in excess of 25 rad would be required for lifesaving operations. It is not possible to prejudge the risk that one person should be allowed to take to save the life of another. However, persons undertaking an emergency mission in which the dose would exceed 25 rad to the whole body should do so only on a voluntary basis and with full awareness of the risks involved.

For Protection of Valuable Property the limit is 10 rem TEDE (when lower dose is not practicable). In this situation the limit for lens of eye is 30 rad, or three (3) times the TEDE value. The limit for any other organ (including skin and body extremities) is 100 rad, or ten (10) times the TEDE value.

#### 4.7 Potassium Iodide (KI)

If field personnel are expected to receive a cumulative dose to the thyroid (from inhalation of radioactive iodine) which might exceed 10 rem, then a dose regimen of Potassium Iodide (KI) should be considered. Since Environs Monitoring teams have the greatest potential need for thyroid blocking, KI should be administered at the time of initial dispatch. This action would allow absorption of the KI prior to the exposure. Authorization shall be provided by the most senior member of RADCON who is available on a timely basis. Otherwise, teams are granted authorization by this procedure to self-administer KI in accordance with the TVA Protective Action Levels on **Appendixes F, G, and I**. Field Control is to be immediately informed of such action.

The decision of KI for field team members other than Environs Monitoring Teams shall be based upon their needs. The CECC Environs Assessor has the responsibility to authorize the administration of KI for field staff under CECC control. The Environs Assessor shall inform the CECC RAM of that action. The person authorizing the issuance of KI shall be familiar with the Food and Drug Administration's approved package insert and ensure each recipient is similarly informed.

- Document the authorization and acceptance of KI on **Appendix E**.

#### 4.8 Contamination Control

Use equipment and materials to identify contamination and minimize its spread to personnel and the vehicle interior. Interior air-lock door should remain closed. Exercise precautions with use of personal protective equipment, such as respirators against adverse impacts to safe vehicle operation. Place contaminated clothing and waste in plastic bags and store in the van until arrangements can be made for final disposal. Contact Field Control for arrangements with personnel and vehicle decontamination.

### 5.0 COMMUNICATIONS

#### 5.1 Primary Motorola Radio

**CAUTION!:** Avoid radio damage caused by operating two mobile units which are closer than a few hundred feet. If a backup radio is used, turn the primary radio off.

The **POWER** switch is on the bottom right side of the front control unit.

Select transmitters with **MODE** switch. Selections are programmed in the following order:

- |                  |                 |                  |
|------------------|-----------------|------------------|
| 1. WILSON - BFN  | 4. deleted      | 7. MONTLKE - SQN |
| 2. BRINLEY - BFN | 5. deleted      | 8. OSWALD - WBN  |
| 3. MONTE S - BFN | 6. SIGMTN - SQN | 9. RSVLT - WBN   |

**VOL** adjusts the volume, (range 1-15 with normal volume around 10).

**SQL** button on keypad unscelches radio. Press **SQL** momentarily to display "**MONITOR ON**" to allow channel monitoring. Display alternates between "**MONITOR ON**" and "**MONITOR OFF**".

**SQL** also used to set the squelch level (0-4). Depress **SQL** and hold until the beep, then adjust up or down using the **MODE** switch. Then press **HOME** to return to normal operation. Repeat adjustment to the minimal level at which continuous static is eliminated.

**HOME** button returns the unit to normal operation after adjustment of squelch. **HOME** button also returns the unit to the first transmitter in the programming sequence.

**DIM** adjusts brightness of the display (four levels with one off). The primary position for the **DIR** button should be with the red light **OFF** (unit will now automatically activate the repeater).

**F/R** switch is for activation of either the front/rear control. "**REMOTE**" or "**REAR**" display indicates the other control head is operational. Depressing the **F/R** button repeatedly alternates the front and rear control function.

The **SCAN**, **EMER** and keypad keys are not operational.

Use Microphone keypad for entry of radio-phone patch numbers.

**NOTE:** Ensure the active repeater is displayed (versus "**REMOTE**" or "**REAR**") prior to attempting data transmission.

**5.2 Cellular Telephones**

Depress **PWR** [power]. If unit reads "*Loc'd*", enter the unlock code of "*REP*" or 737.

To use unit as a speaker phone (hands-free operation) leave unit in the cradle. The microphone is mounted above the driver's window.

- To answer a call, press **SND**.
- To hang-up, or clear a number, press **CLR/END**.
- To place a call, enter number then press **SND** [send]. If calling long distance, dial the area code with the number (use of "0-" or "1-" may vary with location).
- 24 hour assistance: Public telephone 1-800-333-4004, From vehicle 611

**5.3 Important Phone Numbers**

Location	Phone	Phone	Fax Machine
CECC Environs Assessor	423-751-1623	423-751-1624	423-751-1681
BFN RMCC	423-751-1672	256-351-0441	256-355-1680
SQN RMCC	423-899-9858	423-751-1676	423-855-0190
WBN RMCC	423-981-5608		865-981-5632
BFN TSC RADCON	256-729-3767	256-729-3763	256-729-3742
SQN TSC RADCON	423-843-6472		423-843-6461
WBN TSC RADCON	423-365-8606	423-365-8608	423-365-8365
CECC Operations Duty Specialist (24 hr)	423-751-1700	800-237-2322	
TVA Police (to report accidents)		800-824-3861	

Vehicle Cellular Phones		
CECC Courier	TV-12332	423- 667-7512
CECC Truck 1	TV-44062	423- 240-6267
SQN Truck 2	TV-44063	423- 240-6268
SQN Truck 3	TV-44053	423- 667-4921
WBN Truck 4	TV-44054	423- 667-4918
BFN Truck 5	TV-44084	256-508-4872
BFN Truck 6	TV-44052	256-656-9623
Screening van (voice & fax)	TV-44019	256-740-1566

#### 5.4 HP Radio System Phone Patch

To place a telephone call from a mobile radio:

Enter proper access code and wait for a dial tone (if no tone, depress # to clear command and restart).

<u>Access Code</u>	<u>Transmitter Locations</u>	<u>Plant Site/Local Area</u>
"*" 01	Wilson Hydro Plant	BFN/Muscle Shoals
"*" 02	Brinley Mountain	BFN/Decatur
"*" 03	Monte Sano	BFN/Huntsville
"*" 06	Signal Mountain	SQN/Chattanooga
"*" 07	Montlake	SQN/Soddy-Daisy, Dayton
"*" 08	Oswald Dome	WBN/Cleveland, Athens
"*" 09	Roosevelt Mountain	WBN/Spring City, Rockwood

After the dial tone, dial "9" for a second dial tone.

Depress "1" + (Area Code) + 7 digit number + "\*". (Chattanooga calls may not require long distance area code.)

Depress "#" to disconnect (hang up).

#### 6.0 ELECTRICAL POWER SUPPLIES

Circuit breakers for the vehicle's electrical system are located in a gray breaker box inside the cabinet 8. Additional circuit breakers for the onboard generator are located on the rear facing side of the generator housing.

**CAUTION!:** *Avoid contact with unshielded energized components.*

#### 6.1 Vehicle-Installed Generator

Place **GENERATOR-SHORE POWER** switch to the *neutral* position to avoid attempted starts under load.

Depress generator **START/STOP** button, and hold until the engine is running.

Place **GENERATOR-SHORE POWER** switch to the *generator* position.  
Primary vehicle outlets are now supplied power.

The onboard generator may be run continuously during vehicle operation, using the vehicle tank for fuel. If the generator is no longer needed, depress the **START/STOP** button and **hold** until the engine stops completely.

6.2 DC to AC Power Inverter (back up use only)

Ensure vehicle engine is running and **MASTER** switch on the front console is **ON**.

Place the **INVERTER** switch, located on the cabinet door panel, to the **ON** position.

If power to the wall outlets is not available, ensure the **DC Input Circuit Breaker** switch on the inverter panel face is in the **ON** position and ensure the **ON/OFF switch** is in the **OFF** position (units run on remote hookup setting).

6.3 TVA Siren

**CAUTION!:** Beware of wasps in the power outlet boxes and potential electrical hazards such as wet ground!

Unlock outlet box using key # 0896. Check Ground Fault Interrupter breaker status.

6.4 Honda Generator (EX1000)

Remove generator from vehicle, add fuel as necessary and attach **Ground Fault Interrupter (GFI)** cord to generator socket.

Slide **ENGINE** switch, on front of unit, upward to **ON**.

Push **CHOKE** lever, on rear of unit, in direction of arrow to **CLOSED**.

Pull start cord and prevent it from snapping back against unit.

Turn the **CHOKE** lever to **OPEN** as the engine warms up.

7.0 AIR SAMPLING

7.1 Preparation for Plume Air Sample

**CAUTION!:** Silver Zeolite has a heat-up/explosive potential and may require disposal as a mixed waste.

Load head with a Silver Zeolite cartridge, marked to indicate direction of the air flow.

Install a prefilter (rough side out).

Position the vehicle so that the air sample port is toward the plant or upwind direction.

**Record 1-meter dose rates for the area on Appendix F.** Use ISM if above 2 mrem/hr. Do not obtain near ground dose rates unless instructed.

**Note:** Onboard generator power fluctuations affecting flow rate may occur during simultaneous use of the roof top air conditioner unit. It may be necessary to cut the air conditioner off during sampling; or to use the AC/DC inverter as the power source. If power is interrupted during a sample collection, the unit will display the collected sample data upon restoration of power.

## 7.2 Radeco H810 Air Sampler - GRAB SAMPLE

**Grab Sample: 5 minute run at 60 LPM (2 CFM) flow rate**

Turn power ON using rocker switch on side of unit.

After display stops scrolling, depress the **CLEAR** key to reset the unit. Display should now read "*TARGET VOLUME: 300 LITERS*".

Depress green **START** key to begin sample collection, then following the message "*WARM UP DELAY IN PROGRESS*", observe the display to confirm the desired flow rate of 60 LPM. Adjust as necessary using the recessed slotted screw head above the on-off switch. To perform adjustments, turn the slotted screw head clockwise to increase flow rate and counter-clockwise to decrease flow rate. Since the digital display is very accurate, a flow rate  $\pm 6$  LPM (10%) is satisfactory. Close cabinet door during sampling.

Sampler will automatically shut off upon collection of pre-set volume (300 Liters).

## 7.3 Radeco H810 Air Sampler - CONTINUOUS RUN

**Continuous Run: 30 LPM (1 CFM) flow rate**

Turn power ON using rocker switch on side of unit.

After display stops scrolling, depress the **CLEAR** key to reset the unit. Display should now read "*TARGET TIME XXXX*" or "*TARGET VOLUME XXXX*".

Depress green **START** key to begin sample collection, then following the message "*WARM UP DELAY IN PROGRESS*", observe the display to confirm the desired flow rate of 30 LPM. Adjust as necessary using the recessed slotted screw head above the on-off switch. To perform adjustments, turn the slotted screw head clockwise to increase flow rate and counter-clockwise to decrease flow rate. Since the digital display is very accurate, a flow rate  $\pm 3$  LPM (10%) is satisfactory.

Depress **STOP** key to end sample.

#### 7.4 Analysis of Air Sample

Close sampling portal and cabinet door at end of sampling. If using a power inverter, turn it OFF when not in use.

Relocate as necessary for ALARA purposes prior to continuing.

Remove the cartridge and seal it in plastic wrap. Be cautious of cartridge heat up and the effect on the plastic wrapping. Survey the cartridge with a GSM (beta shield closed).

If  $\leq 1$  mrem/hr, analyze with the NaI detector, record data on **Appendix G, column 12**.

If  $> 1$  mrem/hr, do **NOT** analyze with the NaI detector. Advise Field Control and approximate iodine concentration using the formula below:

$$\mu \text{ Ci/cc} = \frac{\text{Average Front \& Back contact rate (mrem/hr)} \times 5.1 \times 10^{-3}}{\text{Sample Volume in Liters}}$$

Note: Formula referenced in RIMS L91 880217 801

Remove the prefilter with tweezers, and survey using the Bicon Surveyor 50.

If  $\leq 50,000$  CPM, analyze in GM detector, record data on **Appendix G, column 13**.

If  $> 50,000$  CPM, do **NOT** analyze in the GM detector. Contact Field Control for instructions.

Label and package all samples for transfer to the Courier. (Refer to section 8.5).

Report data per **Appendix G**. Report results as "Less than MDA" if below values and background rates listed on **Appendix G**.

Note: Minimum Detectable Activities for Bicon Analysts per memorandum to C. D. Pond, from J. L Lobdell, dated March 28, 1995 (RIMS L91 950328 800). **Do not delete!**

### 8.0 TERRESTRIAL SAMPLES

#### 8.1 Vegetation Sample

If possible, avoid sampling an area sheltered by trees and obtain samples which are representative of the pasturage where the grass depth is as close to uniform as practical.

**RECORD** a one-meter GSM window-closed measurement on a sample label.

Using grass cutters, cut grass near the ground. Avoid pulling up grass since roots are not desired. Pack a marinelli beaker to obtain as large a mass as practical. The sample parameter is activity per kilogram.

Seal the beaker cover with electrical tape, keeping the tape slightly stretched while wrapping.

Affix a sample label with the date, time, location, sample type, exposure rate at one meter above ground and the initials of the collector.

Repeat the sampling process, placing the second sample in a zip-lock plastic bag instead of a beaker. Label in the same manner, using a separate sample number.

## 8.2 Soil Sample

Soil samples should be collected from areas that are relatively free of vegetation, rocks and roots. If vegetation cover can not be avoided, it should be sampled with the soil and the analytical results combined to measure the total deposition per surface area.

**RECORD** a one-meter GSM window-closed measurement on a sample label.

Prepare the hole cutting tool (approx. 4.25 inches in diameter) to obtain the soil sample by adjusting the collar above the cutting tube for a 2 or more inch cutting depth.

Collect 5 core samples from a square meter area (4 corners and 1 center). The desired sample parameter is square meters, do not obtain more or less core samples.

Note: 5 core diameters equals 0.046 square meters. Screening van/fixed lab may multiply activity/sample results by 22 to obtain activity/square meter).

The correct sample depth is obtained by pushing the core tool fully into the ground, and removing the top one centimeter (about one-half inch) from the top of the core (using the putty knife) as the sample retained.

If the soil is too dry or sandy to allow coring, use the shovel or putty knife to collect material about one centimeter deep (approx. 1/2 inch) in the pattern described above.

Place the sample in a marinelli beaker and seal with electrical tape. Affix a sample label with the date, time, location, sample type, sample area, dose rate at one meter above ground and the initials of the collector.

Repeat the sampling process, placing the second soil sample in a large zip-lock plastic bag instead of a beaker. Label in the same manner, using a separate sample number.

## 8.3 Snow/Ice Sample

**RECORD** a one-meter GSM window-closed measurement on a sample label.

Set the core tool for a 4 inch depth. Collect 5 core samples from a square meter area (4 corners and 1 center). The sample parameter is surface area, do not obtain more or less core samples. Ascertain the desired sampling depth from the Environs Assessor, based upon meteorological history.

Note: 5 core diameters equals 0.046 square meters. Screening van/fixed lab may multiply activity/sample results by 22 to obtain activity/square meter).

Place the snow/ice in double plastic bags. Check bags for leakage.

Take a second sample (new sample number) approximately 3 meters from the first by repeating the above steps.

Affix a sample label to both samples.

After the snow/ice melts, pour each sample into separate sample jugs and transfer the sample labels to the jug(s). The funnel in cabinet 10 may be useful for filling the jug.

**NOTE:** Instructions for sampling of snow and ice are required per INPO SOER 83-002, "Steam Generator Tube Ruptures", recommendation 11. WBN TROI ID: INPO SOER 83-002, August 22, 1994. . **Do not delete this reference!**

**8.4 Other Samples**

**RECORD** a one-meter GSM window-closed measurement on a sample label.

Any liquid sample container shall be placed in double poly bags with absorbent material.

Outside bags/container of samples should be dry, non-contaminated, labeled and if necessary display a caution radioactive material tag.

Certain types of environmental samples (i.e., rainwater, milk, food crop, fodder and feed, well water) may be requested by Field Control to assist State activities. The minimum sample quantity, type of container and any special controls will be defined dependent on the needs of the situation.

**8.5 Sample Identification and Labeling**

Each sample shall be tagged with an identification label containing the following appropriate data:

Sample Number	Sample Type
Sampling Start and Stop Time	Sampling Flow Rate
Location sampled	Time/Date
Name of the Collector	Sample Area (if applicable)

The sample number is composed of the abbreviation of the Truck number (T2-xx), assigned to the vehicle followed by a dash and the consecutive number of the sample and type of sample (i.e., T2-II, T2-1P). This is important to avoid confusion with State collected samples which may be labeled as "S-#", (T =T VA. S = State).

**8.6 Isotopic Analysis of Samples**

Isotopic analysis of samples may be provided by the screening van or by WARL. Analysis results are to be reported to the Environs Assessor and Field Coordinator.

**9.0 OPERATIONAL READINESS - (Equipment and vehicles)**

As a minimum, inspections/inventory checks shall be completed each calendar quarter. Additional inspection guidelines may be contained in location-specific procedures.

**9.1 Monitoring Team Vehicles**

- Inventories and inspections shall be in accordance with **Appendix J**.
- 
- Inspection checklists shall be forwarded to the applicable site Emergency Preparedness (EP) Manager prior to the end of the calendar quarter.

A site-specific method of providing accountability control of equipment and materials between inspections shall be practiced. Inventories shall be completed after drills, training, or emergency use. The training instructor is responsible for inventories following training activities and the RADCON organization is responsible for inventories following drills or emergency response. In either case, a signed inventory form with comment confirming the vehicle was returned in the "as found" condition is sufficient. These inventories shall be forwarded to the Site EP Manager prior to the end of the calendar quarter.

**9.2 Screening Van Equipment**

A screening van is stationed at the Western Area Radiological Laboratory (WARL). Inventories and inspections shall be in accordance with **Appendix K**.

**9.3 Field Coordinator Equipment**

A Field Coordinator Kit is available at WARL and the CECC. Inventories and inspections shall be in accordance with **Appendix L**.

**9.4 Courier Equipment**

A Courier Kit is available at the Central Emergency Control (CECC). Inventories and inspections shall be in accordance with **Appendix M**.

**10.0 REFERENCES**

- 10.1 Radiological Emergency Plan.
- 10.2 Collection of Environmental Monitoring Samples, SC-01, Radiological Laboratory Procedures Manual.
- 10.3 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." NUREG-0654 FEMA-REP-1, Rev. 1 (1980).
- 10.4 "Emergency Dose Assessment Procedures for Atmospheric Releases of Radioactivity from TVA Nuclear Plants." TVA Publication RH-82-1-RA1 (1984).
- 10.5 "Evaluation of Radiation Emergencies and Accidents Selected Criteria and Data," International Atomic Energy Agency, Vienna (1974).
- 10.6 "Manual of Protective Action Guide and Protective Actions for Nuclear Accidents", EPA-400, October 15, 1991.
- 10.7 Data Systems Radiological Emergency Procedures, CECC-EPIP-12.
- 10.8 "Domestic Licensing of Production and Utilization Facilities," 10 CFR 50.
- 10.9 TVA CECC EPIP-7, CECC RADIOLOGICAL ASSESSMENT STAFF PROCEDURE FOR ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY
- 10.10 INPO SOER 83-002, "Steam Generator Tube Ruptures", recommendation WBN TROI ID: INPO SOER 83-002, August 22, 1994.
- 10.11 "Standards for Protection Against Radiation", 10 CFR 20.

Appendix A

**Plant Lab Dispatch**

1. Select two qualified persons per team and instruct them to complete Appendix B.

**Qualifications**

Environ's Monitoring Van training	Radiation Worker Training (or equivalent)
Use of full face respiratory protection	Valid Driver's License

**NOTE:** Environ's Monitoring Van training is not required if person is limited to vehicle driver duty under direct supervision of a fully qualified team leader.

2. For WBN emergencies immediately request a second team from SQN. Instruct SQN staff to establish radio contact with WBN (attempt both WBN repeaters).
3. If the response is for a plant release with known or potential radioiodine exposure, request authorization for teams to take KI prior to leaving the building (refer to section 4.7) Simulate for drills and do not take if known allergy exists.
4. **Complete the following on field personnel: (Provide to CECC for transfer of control.)**

Team Member	Social Security Number	Y.T. D. Dose	10CFR20 Limit	KI Taken Yes/No	Time of KI

5. Obtain the following from the Control Room or SPDS and advise teams for deployment:

Suspected Release in progress?	Yes / No	Time:
Wind Direction (from)	(degrees)	(compass direction)
Wind Speed	(m.p.h)	(Note: meters/sec. x 2.2 = m.p.h)

6. As teams establish radio contact, test available transmitters to determine the best reception and advise teams of same. If reception is poor, depress "MUTE" for transmitters not selected.
7. Report field team data to the TSC per **Appendix I**.
8. Update wind direction periodically to adjust field team deployments.

**Appendix B**

**Monitoring Team Activation / Shift Turnover**

Complete **PROMPTLY!** Emergency classifications may depend on field data.

**INITIAL DEPLOYMENT ACTIONS**

- Identify which radio transmitter to use for initial contact.
- Collect keys, instruments, sources, KI and any personal respirator spider glasses.
- Request/administer KI if authorized. *Simulate for drills and do not take if known allergy exists.*
- Monitor dose rates with GSM while enroute to truck.



**UPON ARRIVAL AT TRUCK**

- Don TLD, 200 mrem and 5 rem DRD. (Record DRD readings ONLY on **Appendix D.**)
- Wrap one GM probe in plastic (bag or saran wrap) and secure outside window with beta window open and facing up. Place second GM and ISM (window closed) inside vehicle.
- Establish contact with Field Control.



**IF YOU ARE THE FIRST TEAM TO ACTIVATE**

- **DELAY** scaler set-up. Obtain updated wind direction and plant release status.
- Unless directed otherwise, immediately obtain dose rate measurements along the designated site boundary route per the 2 mile EPZ map. NOTE: Wind direction may fluctuate from the reported direction, therefore, actively search for the plume and report survey results per **Appendix F.**
- Upon arrival at downwind sector, COLLECT a GRAB air sample, (I & P) even if survey meters indicate background levels. If necessary, go to a low background area to complete the remaining items below and report air sample results per **Appendixes F & G.**



**COMPLETE FULL OPERATIONAL READINESS ACTIONS**

- Complete scaler set up per **Appendix C.**
- Complete **Appendix E** if KI was authorized and administered.
- Confirm the truck has at least three-quarters capacity of gas. If equipped, operate on rear tank first (generator runs off front tank).
- Contact field team control to report/confirm dose and limits, synchronize watches, report operational status and request assignment. Note key events in logbook.



Unless directed otherwise, the second team to activate should obtain surveys at **2 and 5 miles out to support SED decisions.** Refer to the table below for BFN releases.

Estimated plume maximum for BFN Stack release						
Stability Class	A	B	C	D	E	F - G
Downwind (miles)	0.4	0.8	1.5	5.0	12.5	18.5

- Coordinate inventory requirements per section 9.1 at end of shift or event termination.

Appendix C

Scaler Set-Up : Bicron Analyst/NaI Detector	
Name:	Analyst Serial #:
Date:	Calibration due date:

1. Perform battery check and position NaI detector in shielded pig.
2. Install cables. Set unit to: Range: x1000 Channel: 1 Response: S Audio: OFF
3. Enter a 1 minute background count: \_\_\_\_\_ counts

Note: If count time is not 1 minute, set the 1/1/10 selector inside the instrument cabinet to 1. See illustration on instrument.

4. Enter a 1 minute Ba<sup>133</sup> contact count: \_\_\_\_\_ counts
5. Enter net counts: (Step 4 minus Step 3) \_\_\_\_\_ counts
6. Enter Ba<sup>133</sup> activity from chart below: \_\_\_\_\_ μCi
7. Enter Step 5 divided by Step 6: \_\_\_\_\_ counts  
μCi
8. Enter acceptance range from instr. label: \_\_\_\_\_ to \_\_\_\_\_

If Step 7 result is within the acceptance range, instrument is ready for use.  
**Record NaI correction factor from label to Air Data form.**

9. If unit fails, check source position. NaI probe, cable, and Bicron Analyst are paired, DO NOT SWITCH. Contact Field Control if replacement scalers are necessary.

Barium Source Activity Chart							
Source ID	2000		2001				
	Nov-Dec	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec
Ba <sup>133</sup> -02-Pt84	.068	.068	.067	.066	.065	.064	.064
Ba <sup>133</sup> -04-Pt84	.070	.069	.068	.067	.067	.066	.065
Ba <sup>133</sup> -05-Pt84	.069	.068	.068	.067	.066	.065	.065
Ba <sup>133</sup> -08-Pt84	.070	.069	.068	.068	.067	.066	.065
Ba <sup>133</sup> -10-Pt84	.068	.067	.066	.066	.065	.064	.063
Ba <sup>133</sup> -11-Pt84	.070	.070	.069	.068	.068	.067	.066
Ba <sup>133</sup> -12-Pt84	.069	.068	.067	.067	.066	.065	.065

Appendix C

<b>Scaler Set-Up : Bicron Analyst/GM Detector</b>	
Name:	Analyst Serial #:
Date:	Calibration due date:

1. Connect cable to shielded detector and perform a battery check.
2. Set unit to: Range: x1000 Channel: Out Response: S Audio: OFF
3. Enter a 1 minute background count: \_\_\_\_\_ counts

<b>Note:</b> If count time is not 1 minute, set the <u>.1/1/10</u> selector inside the instrument cabinet to 1. See illustration on instrument.
---

4. Place Tc<sup>99</sup> source on planchet shelf closest to GM tube.
5. Enter a 1 minute Tc<sup>99</sup> count: \_\_\_\_\_ counts
6. Enter net counts: (Step 5 minus Step 3) \_\_\_\_\_ counts
7. Enter Tc<sup>99</sup> activity from source box label: \_\_\_\_\_ dpm
8. Enter Step 6 divided by Step 7: (efficiency) \_\_\_\_\_   

counts  
dpm

If Step 8 result is within the acceptance range of 0.06 to 0.10, instrument is ready for use. <b>Record GM efficiency (step 8) onto Appendix G.</b>
---

9. If unit fails, check source position. If necessary, the GM tube height can be adjusted slightly. Contact Field Control if replacement scalers are necessary.

**Appendix D**

**Dose Log**

Vehicle Call Sign: (1) \_\_\_\_\_ Social Security # \_\_\_\_\_

Name: (17) \_\_\_\_\_ Emergency TLD # \_\_\_\_\_

10 CFR 20 Limit \_\_\_\_\_ YTD (Prior to incident) \_\_\_\_\_  
(mrem) (mrem)

Time	Dosimeter Reading "AS READ" (mrem)	Total Incident Dose "AS READ" (mrem)	TEDE Estimate "AS CORRECTED" per Field Control (mrem)

Vehicle Call Sign: (1) \_\_\_\_\_ Social Security # \_\_\_\_\_

Name: (17) \_\_\_\_\_ Emergency TLD # \_\_\_\_\_

10 CFR 20 Limit \_\_\_\_\_ YTD (Prior to incident) \_\_\_\_\_  
(mrem) (mrem)

Time	Dosimeter Reading "AS READ" (mrem)	Total Incident Dose "AS READ" (mrem)	TEDE Estimate "AS CORRECTED" per Field Control (mrem)

**CAUTION: BE ATTENTIVE TO PROTECTIVE ACTION LEVELS.**

Appendix E

Emergency Authorizations

1. Emergency Dose Limits

The persons listed below acknowledge they have volunteered to receive an emergency dose, have been briefed on the emergency situation, and are aware of possible consequences of being exposed to a radiation dose up to the authorized limits (see page 2 of 2).

Signature	Social Security #	Limit	Date

AUTHORIZED BY: \_\_\_\_\_  
(Name and title)
(Date)
(Time)

2.0 Issuance of Potassium Iodide (KI)

The persons listed below acknowledge they have been authorized to take KI on a voluntary basis and have read and understand the information provided on the Food and Drug Administration approved package insert.

**Approved Dose: 1 tablet (130 mg) per day**

Signature	Social Security #	Time Taken	Date

AUTHORIZED BY: \_\_\_\_\_  
(Name and title)
(Date)
(Time)



Appendix E

Emergency Authorizations

EPA EMERGENCY DOSE RISK INFORMATION

I.

Health Effects Associated with Whole Body Absorbed Doses Received Within a Few Hours <sup>1</sup> .				
Whole Body Absorbed Dose (rad)	Early Fatalities <sup>2</sup> (percent)		Whole Body Absorbed Dose (rad)	Prodromal Effects <sup>3</sup> (percent)
140	5		50	2
200	15		100	15
300	50		150	50
400	85		200	85
460	95		250	98

<sup>1</sup> Risks will be lower for protracted exposure periods.

<sup>2</sup> Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.

<sup>3</sup> Forewarning symptoms of more serious health effects associated with large doses of radiation.

II.

Approximate Cancer Risk to Average Individuals from 25 rem Effective Dose Equivalent Delivered Promptly.		
Age at Dose (years)	Risk of Premature Death (deaths per 1,000 persons exposed)	Average years of life lost if premature death occurs (years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

Note: Tables referenced from the Environmental Protection Agency's "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", (EPA-400), May 1992, tables 2-3 and 2-4., page 2-12.

GMSM w/o #	ISM w/o #	Surveyor 50 #
GMSM w/c #	ISM w/c #	Surveyor 50 #
Date	Team Members	

REPORT COLUMN NUMBERS  
FOR TYPE OF SURVEY  
1 thru 7 = Plume Traverse  
1 thru 10 = Stationary Survey

①	②			③	④	⑤	⑥		⑦	⑧	⑨		⑩
TEAM #	SAMPLE POINT	LOCATION DISTANCE MILES	DIRECTION DEGREES	TIME TAKEN	PLUME E C ?	GM or ISM	1 METER mrem/hr W / C W / O			GM or ISM	CONTACT mrem/hr W / C W / O		

**TVA PROTECTIVE ACTION LEVELS**

1 A. Any exposure rate > 25 mrem/hr and radioiodine (I-131) air activity is not known.	1A. Potassium Iodide (KI) recommended, notify Field Control.
1 B. Any measured dose rate > 200 mrem/hr.	1 B. Evacuation recommended, notify Field Control.
1 C. Any measured dose rate > 10 rem/hr.	1 C. Evacuation mandatory, notify Field Control.
2 A. TEDE dose of 5 rem.	2 A. Evacuate unless higher dose is authorized, notify Field Control.
2 B. TEDE dose of 25 rad.	2 B. Evacuation mandatory, notify Field Control.

Line denotes revision

Date:	Na I Scaler #	GM Scaler #:
Grab Air Sampler #	Na I Correction Factor:	GM Efficiency:
Cont. Run Sampler #	<sup>131</sup> Iodine MDA = 2.0 E -9 (if bkg. < 255)	Particulate MDA = 2.0 E -9 (if bkg < 276)
Team Members	<sup>131</sup> Iodine $\mu\text{Ci/cc} = \frac{\text{(CPM)} \text{(Correction Factor)}}{\text{volume in liters}}$	Particulate $\mu\text{Ci/cc} = \frac{\text{(CPM)} \text{(4.505 E -10)}}{\text{(efficiency)} \text{(volume in liters)}}$

① TEAM #	② LOCATION S.P. Distance Direction			③ Start Stop	Run Time	Flow LPM	Sample Vol.-L	(16) Sample ID	(12) (13) Counts Rates in CPM			<sup>131</sup> Iodine $\mu\text{Ci/cc}$	Particulate $\mu\text{Ci/cc}$
	Bkg.	Gross.	Net										

**TVA PROTECTIVE ACTION LEVELS**

3 A.	Radioiodine (I-131) air activity > 8.0 E-7 $\mu\text{Ci/cc}$ (40 DAC)	Potassium Iodide (KI) recommended, notify Field Control.
4 A.	Particulate air activity > 1.2 E-7 $\mu\text{Ci/cc}$ (40 DAC)	Respiratory protection recommended, notify Field Control.
4 B.	Particulate air activity > 6.0 E-7 $\mu\text{Ci/cc}$ (200 DAC)	Respiratory protection mandatory, notify Field Control.
4 C.	Particulate air activity > 6.0 E-6 $\mu\text{Ci/cc}$ (2000 DAC)	Evacuation mandatory, notify Field Control.

One radioiodine DAC = 2.0 E -8 $\mu\text{Ci/cc}$	One particulate DAC = 3.0 E -9 $\mu\text{Ci/cc}$
--	--

DATE:	TEAM MEMBERS:
-------	---------------

(1) TEAM #	(2) LOCATION DISTANCE MILES    DIRECTION DEGREES		(3) TIME COLLECTED	(16) SAMPLE IDENTIFICATION	REMARKS or Where SAMPLE was TRANSFERRED to

**SAMPLE IDENTIFICATION ABBREVIATIONS**

P	Particulate (paper filter)	S	Soil	M	Milk
I	Radioiodine (charcoal filter)	V	Vegetation	WW	Well Water
TLD	Environmental TLD	SN	Snow	DWSS	Drinking Water Surface Source / River
RW	Rainwater	ICE	Ice		

Line denotes revision

ORIGIN

CECC   
RMCC   
SITE

RECORDED  
BY:

DATE:

TIME:

SQN  
 WBN

BFN

**CECC USE ONLY**  
RAC  
REVIEW:

**APPENDIX F DATA**

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩		
TEAM #	SAMPLE POINT	DISTANCE MILES	DIRECTION DEGREES	TIME TAKEN	PLUME E C ?	GM ISM	1 METER mrem/hr W / CLOSED W / OPEN		GM ISM	CONTACT mrem/hr W / CLOSED W / OPEN	

**APPENDIX G DATA**

①	②	③	④	(16)	(12)	(13)		
TEAM #	SAMPLE POINT	DISTANCE MILES	DIRECTION DEGREES	TIME TAKEN	PLUME E C ?	SAMPLE IDENTIFICATION	<sup>131</sup> IODINE AIR μCi/cc	PARTICULATE AIR μCi/cc

**APPENDIX D DATA**

(17)	(3)	(18)	(19)	✓ ALL DOSE UNITS IN MILLIREM				KI TAKEN ?	
INDIVIDUAL	TIME	DRD "AS READ"	TOTAL DRD "AS READ"	CORREC. FACTOR	TEDE ESTIMATE "AS CORRECTED"	TEDE LIMIT	Yes/No	Time	

Similar to form TVA 7918A

See next page for TVA PROTECTIVE ACTION LEVELS

Line denotes revision

**TVA PROTECTIVE ACTION LEVELS**

IF	THEN
1 A. Any exposure rate > 25 mrem/hr and radioiodine (I-131) air activity is not known. 1 B. Any measured dose rate > 200 mrem/hr. 1 C. Any measured dose rate > 10 rem/hr.	Potassium Iodide (KI) recommended, notify Field Control. Evacuation recommended, notify Field Control. Evacuation mandatory, notify Field Control.
2 A. TEDE dose of 5 rem. 2 B. TEDE dose of 25 rad.	Evacuate unless higher dose is authorized, notify Field Control. Evacuation mandatory, notify Field Control.
3 A. Radioiodine (I-131) air activity > 8.0 E-7 $\mu\text{Ci/cc}$ (40 DAC) 4 A. Particulate air activity > 1.2 E-7 $\mu\text{Ci/cc}$ (40 DAC) 4 B. Particulate air activity > 6.0 E-7 $\mu\text{Ci/cc}$ (200 DAC) 4 C. Particulate air activity > 6.0 E-6 $\mu\text{Ci/cc}$ (2000 DAC)	Potassium Iodide (KI) recommended, notify Field Control. Respiratory protection recommended, notify Field Control. Respiratory protection mandatory, notify Field Control. Evacuation mandatory, notify Field Control.
One radioiodine DAC = 2.0 E -8 $\mu\text{Ci/cc}$	One particulate DAC = 3.0 E -9 $\mu\text{Ci/cc}$

**Appendix J Page 1 of 4**  
**Monitoring Team Vehicle Inventory**

Note: During quarterly checks, perform Operability Checks (OC) and check battery status with meter. Change out tape as needed.

**1.0 The following items may need to be taken to the vehicle upon activation.**

Qty	Item	"Sat"	Remarks
1	Bicron Analyst with NaI detector and cable		OC
1	Bicron Analyst for GM use with cable		OC
2	Ion Survey Meters (RO2A or RSO-50)		OC
2	Geiger Mueller Survey Meters (14C or E-530)		OC
2	Bicron Surveyor 50s		OC
2	Air samplers for Grab Samples (H810)		OC
2	Air samplers for Continuous Run (H810)		OC
1	Package of Potassium Iodide		Expiration:
1	Ba <sup>133</sup> check source		ID #
1	Tc <sup>99</sup> check source		ID #

**2.0 The following are minimum quantities stored in the vehicle.**

**Enviros Monitoring Vehicle Booklet**

1	CECC EPIP-9 (controlled copy)		Rev.
4	Appendix B. CECC EPIP-9 (photocopies)		Rev.
4	Appendix C. CECC EPIP-9 (photocopies)		Rev.
4	Appendix D. CECC EPIP-9 (photocopies)		Rev.
4	Appendix E. CECC EPIP-9 (photocopies)		Rev.
10	Appendix F. CECC EPIP-9 (photocopies)		Rev.
10	Appendix G. CECC EPIP-9 (photocopies)		Rev.
10	Appendix H. CECC EPIP-9 (photocopies)		Rev.
4	Appendix J. CECC EPIP-9 (photocopies)		Rev.
1	CECC EPIP-23 (controlled copy)		Rev.
5	Appendix G. CECC EPIP-23 (photocopies)		Rev.
1	Site-specific EPIP-10 (controlled copy)		Rev.
1	Georgia Public Service Commission Letter of Intent		Date:

**Miscellaneous Locations**

1	GM detector in lead shield		OC
1	Fire extinguisher -vehicle cab area (check pressure)		
1	Primary Motorola radio		OC
1	Hand held spotlight		OC
1	First-aid kit		



**Appendix J Page 2 of 4**  
**Monitoring Team Vehicle Inventory**

**Work Desk**

Qty	Item	"Sat"	Remarks
1	Battery level tester		OC
2	Flashlights (check battery status)		OC
4	Spare batteries each size (D-cell and 9 volt)		
1	Scientific calculator		OC
2	200 mrem Direct Reading Dosimeters		re-zero
2	5 rem Direct Reading Dosimeters		re-zero
2	TLDs (list expiration date)		Date:
1	Scissors		
1	Allen wrench to fit lead shield top cap bolts		
1	Tweezers		
2	Pens or pencils		
6	Planchets		
20	Radioactive Material tags		
40	Sample labels		

**Cabinet 1**

4	Full-face respirators w/cartridges		
8	Spare respirator cartridges (hepa)		
1	Spray cleaner for decontamination		
15	Massilin cloths		
15	Paper towels		

**Cabinet 2**

	Air Sampling Portal vents and electrical outlets		OC
--	--	--	----

**Cabinet 3**

14	Marinelli beakers (500 ml)		
10	Liquid Sample containers)		
1	Sample Transport bag		

**Cabinet 4**

1	DC to AC Power Inverter		OC
---	-------------------------	--	----

**Cabinet 5**

	(Space reserved for air samplers)		
--	-----------------------------------	--	--

**Cabinet 6**

20	Large plastic radwaste bags		
20	Medium plastic radwaste bags		



**Appendix J Page 3 of 4**  
**Monitoring Team Vehicle Inventory**

**Cabinet 7**

Qty	Item	"Sat"	Remarks
5	Screw on air sampler heads		
1	Box 2 inch prefilters (minimum of 30 each)		
30	Silver Zeolite air sampler cartridges (list expiration date)		Date:
30	Petri dishes		
30	Small zip-lock bags		
30	Large zip-lock bags		
1	Roll of plastic wrap (Saran type)		
1	Box gloves - thin sample handing type (minimum of 20 pair)		
1	Box smears (minimum of approx. 200)		
1	Roll 2 inch paper masking tape		
1	Roll 2 inch duct tape		
1	Roll Radiation Warning Symbol tape		
1	Roll electrical tape		
1	Dosimeter charger		OC

**Cabinet 8**

	Electrical switch panel		OC
	Onboard generator (record run time displayed)		OC hrs.

**Cabinet 9**

1	Logbook		
1	DOT Emergency Response Guidebook		Year:
1	TN, AL and GA State road maps		
1	Sample Point Description book for BFN, SQN, WBN		
6	Area posting signs (Radiation and Contamination Area insert)		
6	Radioactive placards		
1	Trash can		
2	Rain Suits		
2	Insulated coveralls		
Sample Point Maps, latest revision per EPIP-9 section 4.3			
2	BFN 2-, 10-, 50- mile sampling point maps		
2	SQN 2-, 10-, 50- mile sampling point maps		
2	WBN 2-, 10-, 50- mile sampling point maps		

**Cabinet 10**

1	Set Jumper cables		
1	Funnel		
1	Siphon pump/hose		
1	Set of wrenches		
1	Set of screwdrivers		
1	Pair of Pliers		
1	Hammer		
1	Box of 3 reflective triangles		



**Appendix J Page 4 of 4**  
**Monitoring Team Vehicle Inventory**

**Cabinet 11**

Qty	Item	“Sat”	Remarks
24	Pair booties		
24	Pair cotton inserts		
12	Pair Anti-C gloves		
12	Pair rubber shoe covers		
12	Pair coveralls (disposable)		
12	Dressout caps		
12	Hoods		
1	Roll dress-out tape		

**Outside Compartments**

1 ea.	110 volt extension cord (25-, 50-, 100 ft)		
1	External vehicle power supply cord (shore power)		
8	Wooden stakes		
1	Soil sampling tool		
1	Shovel		
400	Feet of radiological warning barrier rope/ribbon		
1	Box plastic sheeting		
1	Putty knife (4 inch)		
1	Grass cutters		
6	Traffic cones		
1	Can of spray paint for marking of areas (i.e., roadway)		
1	Pair of work gloves		
1	Fire Extinguisher (check pressure)		
1	Ground Fault Interrupter		OC
1	Honda gas generator (EX1000)		OC

Vehicle Location: \_\_\_\_\_ Vehicle tag #: \_\_\_\_\_

Purpose of Inspection:     Monthly     Quarterly     Post training/drill/response

Additional Comments: \_\_\_\_\_

- 
- Forward for signatures below. EP Manager to receive by end of calendar quarter.

Inspected by:		Date:	
Supervisory Review:		Date:	
EP Manager:		Date:	

Appendix K Page 1 of 4  
**WARL Screening Vehicle Inventory**

Note: During quarterly checks, perform Operability Checks (OC) and check battery status with meter. Change out tape as needed.

**1.0 Items stored in WARL.**

Qty	Item	"Sat"	Remarks
1	Geiger Mueller Survey Meter with pancake probe		OC
1	Geiger Mueller Survey Meter		OC
1	Package of Potassium Iodide		Expiration:
2	Calibration sources for Germanium detectors		
1	Radioanalytical Laboratory Procedures Manual		
1	Sample Transport case		
1	ND-76 multi-channel analyzer		

**2.0 The following are minimum quantities stored in the vehicle.**

**Miscellaneous Locations**

2	Intrinsic Germanium detectors		
1	Liquid nitrogen dewar		
2	NIMBI standard power bins		
2	High-voltage power supply modules		
2	Spectroscopy amplifiers		
2	ND 570 ADCs		
2	Fire Extinguishers		
1	Uninterruptible Power Supply		
1	ND 6700 Gamma analysis system with terminal and printer		

**Cabinet A**

1	Set of wrenches		
1	Set of screwdrivers		
1	Pair of pliers		
1	Set of allen wrenches		
1	Pair insulated gloves (nitrogen handling)		
2	Pair leather or canvas work gloves		
2	Pair cloth glove inserts		

**Cabinet B**

1	Tape dispenser with 1 refill		
1	Roll of "Radioactive Material" tape		
1	Roll 3/4 inch fiber tape		
1	Roll 2 inch Scotch tape		
1	Roll 2 inch masking tape		



Appendix K Page 2 of 4  
WARL Screening Vehicle Inventory

**Cabinet B (continued)**

Qty	Item	"Sat"	Remarks
1	Roll 3/4 inch masking tape		
3	Rolls electrical tape		
1	Calculator		OC
1	Box 2 inch filter papers		
10	Tags (with string)		
25	"Radioactive Material" tags		
1	Bottle alcohol		
1	Pack cotton swabs		
10	Pair rubber or plastic gloves		
1	Direct Reading Dosimeter charger (AC or battery powered)		OC

**Cabinet C**

10	Shallow planchets		
5	Deep planchets		
2	Boxes smears		
50	Small Ziplock bags		
20	Large Ziplock bags		
1	Roll clear plastic wrapping (Saran type)		
5	Yellow "Radioactive Material" plastic bags		

**Cabinet D**

10	Marinelli beakers (500 ml)		
20	Petri dishes		
1	500 ml graduated cylinder		

**Cabinet E**

4	D-cell batteries		
2	9-volt batteries		
4	AA batteries		
1	Siphon hose		
1	Box of replacement fuses for equipment		
1	Spotlight		OC
1	Flashlight with batteries		OC
1	Balance (3000 gram capacity) with check wts.		

**Cabinet F**

2	Rainsuits		
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**Cabinet G**

6	Pairs disposable coveralls		
---	----------------------------	--	--



**Appendix K Page 3 of 4**  
**WARL Screening Vehicle Inventory**

**Cabinet H**

Qty	Item	"Sat"	Remarks
2	Orange safety vest		
4	Pairs rubber shoe covers		

**Cabinet I**

1	Radiological Health Handbook		
1	DOT Emergency Response Guidebook		Year
2	Germanium Detector Manuals		
1	Sample Point Description Booklet (each site)		

**Environs Monitoring Vehicle Booklet**

1	CECC EPIP-9 (controlled copy)		Rev.
2	EPIP-9. Screening Vehicle Inventory (photocopies)		Rev.
2	EPIP-9. Dose Logs (photocopies)		Rev.
2	EPIP-9. Emergency Authorizations (photocopies)		Rev.
20	Isotopic Analysis forms		
1	Georgia Public Service Commission Letter of Intent		Date:

**Cabinet J**

	Miscellaneous spare cables for gamma systems		
--	--	--	--

**Cabinet K**

1	Can insect repellent		
1	Can de-icing fluid		
1	Can wasp insecticide		
1	First-Aid kit		
1	Can decontamination spray or foam		

**Drawer 1**

Sample Point Maps, latest revision per EPIP-9 section 4.3			
2	BFN 2-, 10-, 50- mile sampling point maps		
2	SQN 2-, 10-, 50- mile sampling point maps		
2	WBN 2-, 10-, 50- mile sampling point maps		
1	State Highway map for Georgia, Tennessee and Alabama		
2	Germanium detector logbooks		
1	Germanium detector control chart book		
1	Germanium detector efficiency table book		



Appendix K Page 4 of 4  
WARL Screening Vehicle Inventory

**Drawer 2**

Qty	Item	“Sat”	Remarks
2	TLDs (list expiration date)		Date
2	200 mrem Direct Reading Dosimeters		
1	Control TLD (list expiration date)		Date
2	Lab markers		
2	Pens		
4	Mechanical pencils		
1	Steno pad		
1	Set of jeweler’s screwdrivers		

---

Vehicle Location: \_\_\_\_\_ Vehicle tag #: \_\_\_\_\_

Purpose of Inspection:     Quarterly     Post Training     Post Drill / Response

Additional Comments: \_\_\_\_\_

- Place completed copy of quarterly inventory in front of vehicle booklet.
- Forward for signatures below.

Inspected by:		Date:	
WARL Manager:		Date:	

Appendix L

Field Coordinator Kit Inventory

**Emergency Preparedness Implementing Procedures**

Qty	Item	“Sat”	Remarks
1	CECC EPIP-7 (controlled copy)		Rev.
1	CECC EPIP-9 (controlled copy)		Rev.
1	CECC EPIP-12 (controlled copy)		Rev.
1	CECC EPIP-23 (controlled copy)		Rev.
1	REND (controlled copy)		Rev.

**Miscellaneous Items <sup>1</sup>**

Qty	Item	“Sat”	Remarks
1	Radiological Health Handbook		
12	TLDs (list expiration date)		Date
1	Scientific calculator		
50	Copies of Environs Monitoring forms (TV 7918A)		Date
10	Copies of Clerical Logsheets		
1	Logbook		
1	Package of Potassium Iodide (list expiration)		Date
1	Flashlight & batteries		
1	DOT Emergency Response Guidebook		Year
1	Tennessee Highway road map		
1	Alabama Highway road map		
1	Georgia Highway road map		
1	Sample Point Description booklet for BFN		
1	Sample Point Description booklet for SQN		
1	Sample Point Description booklet for WBN		

Sample Point Maps, latest revision per EPIP-9 section 4.3			
2	BFN 2-, 10-, 50- mile sampling point maps		
2	SQN 2-, 10-, 50- mile sampling point maps		
2	WBN 2-, 10-, 50- mile sampling point maps		

<sup>1</sup> Miscellaneous office supplies may also be contained in the kit for convenience purposes.

Kit Location:             CECC                             BFN

Purpose of Inspection:    Quarterly     Post Training     Post Drill / Response

Additional Comments: \_\_\_\_\_

Inspected by:		Date:	
Manager Review:		Date:	

Appendix M

Courier Kit Inventory

Qty	Item <sup>1</sup>	“Sat”	Remarks
1	CECC EPIP-9 (controlled copy)		Rev.
1	200 mrem Direct Reading Dosimeter		
1	TLD (list expiration date)		Date
1	Dosimeter charger with battery		
1	Flashlight & batteries		
1	First-aid kit		
1	Scientific calculator		
1	Pair Disposable coveralls		
4	Pair booties		
10	Pair sample handling gloves and cotton liners		
1	Pair work gloves		
1	Package of Potassium Iodide (list expiration)		Date
12	Radioactive Material tags		
12	Sample labels		
12	Yellow “radioactive material” bags		
1	Roll of duct tape		
1	Roll of electrical tape		
1	Rain coat		
1	Logbook		
3	Pens		
1	Sample transport container		
1	DOT Emergency Response Guidebook		Year
1	Highway road map including TN, AL and GA.		
1	Sample Point Description booklet for BFN		
1	Sample Point Description booklet for SQN		
1	Sample Point Description booklet for WBN		

Sample Point Maps, latest revision per EPIP-9 section 4.3			
1	BFN 2-, 10-, 50- mile sampling point maps		
1	SQN 2-, 10-, 50- mile sampling point maps		
1	WBN 2-, 10-, 50- mile sampling point maps		

<sup>1</sup> Miscellaneous office supplies may also be contained in the kit for convenience purposes.

Purpose of Inspection:     Quarterly     Post Training     Post Drill / Response

Additional Comments: \_\_\_\_\_

Inspected by:		Date:	
Manager Review:		Date:	