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A045

CALLAWAY PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EIP-ZZ-00211

FIELD MONITORING

RESPONSIBLE DEPARTMENT Emergency Preparedness

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APPROVED BY 

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This procedure contains the following:

Pages	1	through	10
Attachments	1	through	3
Tables		through	
Figures		through	
Appendices		through	
Checkoff Lists		through	

This procedure has _____ checkoff list(s) maintained in the mainframe

Conversion of commitments to TRS reference/hidden text completed by Revision

ITS Commitments N/A Non-T/S Commitments 017

ORIGINAL
for the NRC

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FIELD MONITORING

1 PURPOSE AND SCOPE

1.1 PURPOSE

Implement processes, in the event of a radioactive release from Callaway Plant, to support dose projection calculations by:

- Sampling a radioactive plume.
- Tracking the path of a radioactive plume.
- Assessing consequences to the surrounding areas resulting from a radioactive plume released from Callaway Plant.

1.2 SCOPE

Establishes responsibilities of Field Monitoring Teams (FMT) members, communicators, and coordinators.

Quickly form, brief, and dispatch FMTs necessary to support dose projections while ensuring:

- Teams have the necessary sampling and safety equipment.
- Equipment is in good condition and operationally checked.

2 RESPONSIBILITIES

2.1 Health Physics Coordinator (HPC) forms FMTs.

2.2 Dose Assessment Coordinator (DAC) directs and assesses FMT activities. **COMN 3396**

2.3 Dose Assessment Staff (DAS) reports to the DAC. DAS record FMTs location and sample data. DAS maintain the radiological status boards in the EOF. **COMN 3355**

2.4 FMTs track and quantify plume dose rates. In cooperation with the State Department of Health, FMTs also assist in the collection of environmental sample media. **COMN 3396**

3 PRECAUTIONS

3.1 FIELD MONITORING TEAM

3.1.1 Primary method of communication between FMTs and the EOF is the radio on Repeater Plant 2.

3.1.1.1 If radio communications are lost or intermittent, the cellular phone should be used.

3.1.2 Primary method of communication between FMTs and the Backup EOF should be the cellular phone.

3.1.2.1 If phone communications are lost or intermittent, use the radio on Repeater Plant 2.

3.1.3 If communications cannot be established via alternate radio channels or cellular phone, return to the appropriate facility (EOF, Backup EOF, or Callaway Plant) and contact the DAC.

3.1.4 Minimize the time in the plume. Perform all sample counting and calculations outside the plume location.

3.1.5 Ventilation from outside sources should be minimized upon entry into the plume. Place vehicle ventilation in recirculation (depress MAX button, REC will light on your display) or off (for vehicles without A/C). Ensure windows are closed.

3.1.6 Silver Zeolite cartridges used for Iodine sampling are a hazardous waste. Return all cartridges to Radwaste for processing in accordance with APA-ZZ-00830.

3.1.7 Designation of radioactive materials is not necessary while the items are under the control of a Field Monitoring Team member.

4 PROCEDURE

4.1 TEAM FORMATION

4.1.1 The HPC designates a FMT Leader from the available Support Area Personnel.

4.1.2 The HPC requests a FMT Driver from the Ops Support Coordinator.

4.1.2.1 FMT obtains the vehicle keys from the Ops Support Coordinator or Health Physics Coordinator.

4.1.3 HPC briefs the FMT on current conditions. Record information on Attachment 1, Section I , Team Formation.

4.2 EQUIPMENT CHECKOUT

4.2.1 FMT Leader and Driver proceed to the Central Processing Facility (CPF) to checkout FMT equipment. Record equipment checks on Attachment 1, Section II, Equipment Checkout. FMT equipment lockers are located in the whole body count room #1102.

NOTE:	The following steps of Equipment Checkout may be performed in any order.

4.2.2 The FMT Driver should assist the Team Leader as directed.

4.2.3 Response check all survey instruments, applicable operating procedures are located in a binder stored on the outside of the FMT equipment locker.

| 4.2.4 Load instruments, Immediate Field Monitoring Kit, check source, and any additional equipment into the RERP vehicle.

4.2.5 Check the Global Positioning System (GPS) for proper operation. The operator aid is in the FMT procedure binder.

| 4.2.6 Check the DC to AC inverter for proper operation. Operational check of the air sampler using the inverter as the power source satisfies this check.

4.2.7 Check the RERP vehicle fuel supply greater than ½ full. If necessary refuel vehicle from fuel tank located at Stores 1. Key to fuel pump is on the RERP vehicle key ring.

4.2.8 Electronic dosimetry devices (ED) are susceptible to interference from radios and cellular phones. To minimize the possibility of erroneous ED readings perform the following when operating phones or radios:

NOTE:	These checks may be performed during communication check for the radio and the phone.

- Maintain ED at least 4 inches from any antenna or co-axial cable used to connect to remote antenna.
- Check ED readings for possible interference while performing radio and phone checks.

4.2.9 Check the operation of the 2-way radio in the RERP vehicle. Switch the radio to "Repeater Plant 2." Contact FMT Communicator to perform a radio check.

4.2.10 Check the operation of the cellular phone by contacting FMT Communicator and having the FTC return the call. The phone numbers can be found on Attachment 1, FMT Briefing/Debriefing Checklist.

4.3 TEAM BRIEFING

4.3.1 Upon completion of section 4.1 Team Formation and section 4.2 Equipment Checkout, contact the FMT Communicator, and report FMT status. FMT status should be as follows:

- FMT equipment checks completed and satisfactory.
- All FMT equipment loaded in the RERP vehicle.
- FMT ready to be dispatched.

4.3.2 The FMT requests a brief from the DAC. Record information in Attachment 1, Section III Briefing and Dispatch. The brief should include but not limited to following items:

NOTE:	The DAC may have the Field Team Communicator provide the brief.

- Team designator.
- Meteorological updates.
- Status of any releases in progress or possible release.
- Survey and sample locations.
- FMT review Attachment 1, Section IV Precautions.
- Potassium Iodide recommendations.

4.4 PLUME PHASE DOSE ASSESSMENT SAMPLING

CAUTION:	Any time the Model 14C reading exceeds 1 R/hr, leave the area and notify the DAC. **SOS 98-2502**

4.4.1 Determine the leading edge and/or the perimeter sides of the plume by traversing the plume as near perpendicular to the wind direction/plume direction as possible.

4.4.1.1 Place probe of Model 14C on the seat, with the audible indicator on and probe window open facing up.

4.4.1.2 Determine the GPS location when the Model 14C detects the presence of the plume; record the information on Attachment 2, FMT Radiation Survey Sheet.

4.4.1.3 Determine the GPS location the Model 14C detects the highest reading while traversing the plume, record information on Attachment 2, FMT Radiation Survey Sheet. Indicate this as a centerline (C) reading.

NOTE:	It is permissible to obtain readings in step 4.4.2 during the initial pass through the plume if the plume centerline is easily identified. **SOS 99-1680**

4.4.1.4 Determine the GPS location when the Model 14C detects the plumes other perimeter, record the information on Attachment 2, FMT Radiation Survey Sheet.

4.4.2 Return to the plume centerline location and perform the following samples:

4.4.2.1 Record dose rate using the Ion Chamber instrument on the FMT Radiation Survey Sheet.

- Hold meter waist level.
- Instrument window closed.

CAUTION:	Using the DC to AC inverter with vehicle engine off may cause excessive battery drain that could strand the vehicle in an undesirable location. **SOS 98-3384**

4.4.2.2 Obtain a Particulate and Iodine air sample, and if requested by the DAC, include a sample for noble gas. Air sample volumes are typically 10 ft^3 for Particulate and Iodine and 2 minutes for Noble Gas. With DAC permission, sample volumes may be reduced to a minimum of 15 seconds to maintain FMT exposures ALARA. **SOS 98-2505**

4.4.3 Exit the plume and purge the Particulate and Iodine sample by running the sampler for approximately 1-min. to remove noble gas interference.

4.4.4 Using a G-M count rate meter, count the Particulate and Iodine samples. Record gross counts and background counts on the FMT Radiation Survey Sheet. **COMN 42903**

4.4.5 Report survey results and sample locations to the FMT Communicator.

4.5 INGESTION PATHWAY ENVIRONMENTAL SAMPLING

4.5.1 Obtain FMT Recovery Kit, located in the equipment room of the EOF.

4.5.2 Proceed to sample locations as directed by the DAC.

4.5.3 Obtain a closed window radiation readings at waist level (window facing down) for the area to be sampled.

4.5.4 Record radiation readings on Attachment 3, FMT Environmental Collection Worksheet.

4.5.5 Vegetation samples are collected as follows:

CAUTION:	Do not contaminate the sample with soil. Do not collect vegetation from areas that are sheltered from fallout. **SOS 99-1680**

- Collect approximately one cubic foot of vegetation.
- Clip vegetation to approximately one inch above the surface of soil.
- Double bag sample and label appropriately.
- Record sample information on Attachment 3, FMT Environmental Collection Worksheet.

4.5.6 Collect soil sample as follows:

> *CAUTION*: Do not collect soil from areas that are sheltered from fallout.

- If excessive vegetation is present, this should be clipped off approximately 1 inch above the soil surface and discarded. The litter at the surface and the root mat are considered part of the sample.
- Using a shovel, remove two plugs, approximately six by six inches by two inches deep and approximately 1-2 feet apart. Minimize disturbance of the grass cover or surface soil.
- Double bag sample and label appropriately.
- Record sample information on Attachment 3, FMT Environmental Collection Worksheet.

4.5.7 Collect water samples as follows:

- Collect approximately two gallons.
- Double bag sample and label appropriately.
- Record sample information on Attachment 3, FMT Environmental Collection Worksheet.

4.5.8 Collect snow samples as follows.

> *CAUTION*: Do not collect snow from areas that are sheltered from fallout.

- Collect approximately 12 liters.
- Collect snow to a depth that is representative at the time of release. Ensure sample area has been undisturbed since release.
- Double bag sample and label appropriately.
- Record sample information on Attachment 3, FMT Environmental Collection Worksheet.

4.5.9 Return all samples to the EOF for processing.

4.6 FIELD MONITORING TEAM DEBRIEF/RELIEF

4.6.1 Normally, relief and turnover should be performed in the field, if possible.

4.6.2 Upon direction from the DAC, FMTs should report to the EOF or alternative location for debriefing.

4.6.3 Upon return to the EOF and prior to entry to the EOF, FMT personnel should be monitored for contamination.

4.6.3.1 If the FMT personnel are returning for relief or debriefing, and personnel are contaminated, access to the EOF should be through the Decontamination Area.

4.6.4 The FMT Leader ensures the DAC has updated the dose records for FMT members and completes dose information in Attachment 1 Section I, Team Formation.

4.6.5 The FMT Leader should complete Attachment 1, Section V, Debriefing, and return to DAC. **SOS 98-2498**

4.7 FIELD TEAM COMMUNICATOR (FMT TRACKING)

4.7.1 Using the wind direction, draw the plume centerline. The line should be drawn out to a distance based on wind speed and start time of the release.

4.7.2 If the plume centerline is within 3° (round to whole number) of a sector boundary, both sectors bordering that boundary are considered centerline sectors.

4.7.3 Using a different color than was used to draw the plume centerline, outline the outer boundaries of the affected sectors. The affected sectors include the centerline sector(s) and the adjacent sectors. Both sectors on either side of the centerline sector(s) are considered adjacent sectors.

4.7.4 When contacted by the FMT, the DAC may direct the FMT Communicator to brief the FMTs on the status of the emergency. Refer to section 4.3, Team Briefing.

4.7.5 Establish the position of the FMT with corresponding indicators (e.g., RED, BLUE, and GREEN).

4.7.6 FMT Communicator should use Attachment 2, FMT Radiation Survey Worksheet, to record survey results as they are reported by the FMTs.

4.7.7 Update the Field Monitoring Status Boards with current information from Attachment 2.

4.7.8 When sufficient data is available (a minimum of 1 point defining each side edge and a point defining the leading edge), determine and draw the plume perimeter on the map from the FMT information.

4.7.9 The Field Team Communicator should inform the DAC immediately of any significant changes to FMT radiological data.

4.7.10 The Field Team Communicator should periodically update FMTs on plant status and protective actions. **COMN 5405**

5 FINAL CONDITIONS

5.1 The Release has been terminated or is reduced to levels below the Emergency Action Levels (EAL) for the ALERT Emergency Classification.

5.2 All surveys and samples have been obtained as requested, properly identified, and returned to the designated location.

5.3 All the Field Monitoring Teams have returned for debriefing.

5.4 Emergency Kits have been inventoried, restocked, and sealed in accordance with **HTP-ZZ-07003**, Maintenance and Inventory of Health Physics Technical Support Emergency Equipment Kits.

5.5 All records have been collected and sent to the Emergency Preparedness Department.

6 REFERENCES

6.1 Callaway Plant Radiological Emergency Response Plan (RERP)

6.2 **APA-ZZ-00830**, Hazardous Material Control Program

6.3 **HDP-ZZ-01300**, Internal Dosimetry Program

6.4 **HTP-ZZ-04102**, Operation and Calibration of the Eberline RO-2(X) Series Ion Chamber

6.5 **HTP-ZZ-04106**, Operation of the Ludlum Model 14C

6.6 **HTP-ZZ-04108**, Operation of the Ludlum Model 3 Portable Count Rate Meter

6.7 **HTP-ZZ-04121**, Operation and Calibration of the Radeco Model AVS-28A Air Sampler

6.8 **HTP-ZZ-07003**, Maintenance and Inventory of Health Physics Technical Support Emergency Equipment Kits

6.9 FEMA REP-2, REV.2/June 1990, Guidance on Offsite Emergency Radiation Measurements Systems, Appendix D

6.10 HPCI No. 93-005, FMT Personnel Dose Evaluation

7 RECORDS

7.1 QA RECORDS

Attachment 1, FMT Briefing/Debriefing (File K171.0010)

Attachment 2, FMT Radiation Survey Worksheet (File K171.0010)

Attachment 3, Environmental Collection Worksheet (File K171.0010)

7.2 COMMERCIAL RECORDS

None

FMT BRIEFING / DEBRIEFING CHECKLIST

TEAM DESIGNATOR (circle one): **BLUE** - Chemistry Vehicle (#102206)
GREEN - HPTS Vehicle (#102207)
RED - I&C Vehicle (#102004)

I. TEAM FORMATION

	Name	EID	TLD ED Y/N	Exposure Margin (mRem)	Debriefed Yes/No	Final Exposure	Dose Records Updated by DAC
Leader							☐
Driver							☐
							☐

Radioactive Release:

☐ In progress YES / NO START TIME ____:____

☐ Likely to occur YES / NO PROJECTED TIME ____:____

Release location (circle one) UNIT VENT / PORV / OTHER _____

Meteorological Data:

☐ Wind Direction (degrees) From:_____ To:_____

☐ Wind Speed (mph) _____

☐ **Keys:** (may be obtained from **OSC** or the **HPC**)

Dosimetry:

☐ Retain dosimetry (ED, if issued, and TLD) when exiting MAF

Remarks:

II. EQUIPMENT CHECKOUT COMN 42536

Field Monitoring Kits:
Kits located in CPF, whole body count room #1102
Inventory Kit (not necessary if seal is intact)

- ☐ Kit Inventory *(Sat)*

Pre-operational Check Survey Instruments:
(Procedure binder in rack mounted on outside of FMT locker)

- ☐ *Air sampler (Sat)* **HTP-ZZ-04121**
- ☐ *Count rate meter (Sat)* **HTP-ZZ-04108**
- ☐ *Ion chamber survey meter (Sat)* **HTP-ZZ-04102**
- ☐ *GM survey meter (Sat)* **HTP-ZZ-04106 SOS 99-1680**

Load equipment in vehicle:

- ☐ *Immediate FMT Kit*
- ☐ *Recovery FMT Kit (located at EOF equip room if needed)*
- ☐ *Air sampler*
- ☐ *Count rate meter (14c in front seat of vehicle)*
- ☐ *Ion chamber survey meter*
- ☐ *Procedures (located on side of locker)*
- ☐ *Maps*
- ☐ *Emergency light*
- ☐ *Check source*

Other Equipment:

GPS System (Operator aid in FMT Kit).

- ☐ Check GPS operational with vehicle parked at the CPF.
  (GPS is SAT if it reads N38°45.6' to 45.7' W91°47.0' to 47.1')

Air sampler

- ☐ Prepare sample head. (Install filter and cartridge.)
- ☐ Check samplers air flow within calibrated range.

RERP Vehicle

- ☐ DC to AC inverter operational (air sampler checked *Sat*)
- ☐ Fuel greater than ½ full **SOS 98-2506**
  (refuel at tank located at Stores 1, Pump key on vehicle key-ring)

Remarks:

II. EQUIPMENT CHECKOUT COMN 42536 (continued)

Communication Equipment:

Radio

- ☐ Switch radio to Repeater Plant 2.
- ☐ Contact FMT communicator for operational check of the radio. (Maintain ED away from antenna or coaxial cable. Notify DAC if ED interference is observed during Radio Test.) *(Sat)*

Cellular Phone

LOCATION	TELEPHONE NUMBER
FMT Communicator EOF	(573) 676-4924
Backup EOF	(573) 526-9165
HP Coordinator TSC	(573) 676-8711
DAC EOF	(573) 676-4999 / 4907
BLUE FMT (Chemistry Veh #102206)	(573) 220-0173
GREEN FMT (HPTS Veh #102207)	(573) 220-0628
RED FMT (I&C Veh #102004)	(573) 220-2507

- ☐ Contact FMT communicator for operational check of the phone. FMT communicator should also contact FMT to verify phone is operational and phone number is correct. *(Sat)*

III. BRIEFING AND DISPATCH

Contact FMT Communicator:

Remarks

- ☐ Inform FMT communicator, FMT equipment loaded and the team is ready to be briefed and dispatched.

Brief (minimum requirements):

- ☐ Team designator (Identified at top of page 1)
- ☐ Meteorological updates (Section I data)
- ☐ Status of any releases in progress or possible release
- ☐ Survey and sample locations
- ☐ Review of Section IV Precautions by the FMT
- ☐ Potassium Iodide recommendations (**HDP-ZZ-01300** , Attachment 1)

  Recommended (circle one) YES / NO

- ☐ You should <u>not</u> take KI if you are allergic to iodine.

IV. PRECAUTIONS

	Remarks
☐ Maintain communications with the EOF using Repeater Plant 2. If radio communications are lost or intermittent, use the cellular phone. If communications cannot be established through alternate radio channels or cellular phone, return to the appropriate facility (EOF, BEOF, or Callaway Plant) and contact the DAC.	
☐ If the Backup EOF is being used for Field Monitoring Team direction, the cellular phones should be used for primary communications. Backup communications should be performed using Repeater Plant 2.	
☐ Minimize the time in the plume. Perform all sample analysis, calculations, etc., outside the plume location.	
☐ Ventilation from outside sources should be minimized upon entry in the plume. Place vehicle ventilation in recirculation (depress MAX button, REC will light on your display) or off (for vehicles without A/C). Ensure windows are closed.	
☐ No eating, drinking, or smoking is allowed.	

V. DEBRIEFING

FMT Status: ☐ Team(circle one) Secured / relieved ☐ Date and Time _____ ____:____ Problems or Hazards encountered _____ _____ _____	**Remarks**
Surveys: ☐ Survey Worksheet complete and submitted to DAC	
Dosimetry: ☐ Exposure records updated by DAC (complete section I) **SOS 98-2498**	
Internal Exposure: ☐ Probable internal exposure YES / NO ☐ Plume Immersion YES / NO If yes, schedule whole body count location:_____time:_____:_____	

Debriefing by_____
(DAC or designee)

FMT Radiation Survey Worksheet

Team Designator:
Blue Green Red

Weather Conditions:
Clear Rain Snow Sleet Mist

Date:

Dose Data

Member EID	ED Dose (mrem)	Time

Instrument ID's

CRM- -HP
GMI- -HP
ION- -HP
LAS- -HP

Notes:

- RO-XX values are < 0.5 mR/hr, report as < 0.5 mR/hr.
- If a Noble Gas sample is requested, connect marinelli at the sampler exhaust
- Ion Chamber instrument readings are closed window, waist level, unless otherwise noted
- Air samples are approximately 10 ft^3 unless directed by DAC based on keeping exposures ALARA (15 seconds min.) **SOS 98-2505**
- Purge iodine cartridge prior to counting.

Plume Location

Plume Centerline Survey Information

Time	Latitude (N) 38° xx . xxx	Longitude (W) 91° xx . xxx	14 C mrem/hr	* P / C / L	RO-xx Gamma mrem/hr closed window	Bkgd (cpm)	Iodine Gross (cpm)	Particulate Gross (cpm)	Sample duration (min)	Flowrate (cfm)

* P=Perimeter, C=Centerline, L=Leading Edge. Otherwise, leave blank

File K171.0010

ATTACHMENT 2
CA-#246

Environmental Collection Worksheet						
Sample Date	Sample Time	Sample Size	Sample Type	Sample Location		Radiation (mR/hr)
				Latitude (N) 38° xx . xxx	Longitude (W) 91° xx . xxx	

Collected by: _____

Comments: _____

_____

_____

_____

_____

_____

_____

_____

File K171.0010

ATTACHMENT 3
CA-#1137