		1 3H	C 3H
*Backup TSC,OSF-113	C. Warlow	— —	1 —
*Bureau of Rad Protection	M. Vyenielo	— —	1 —
*Control Rm-U/1 File Copy, OOB-1	L. Ritter	— —	1 —
Control Rm-U/1 Shift Mgrs Station, OOB	L. Ritter	— —	— —
*Control Rm-U/1 Work Copy, OOB-1	L. Ritter	— —	1 —
Dauphin County EMA	D. Fetterhoff	— —	— —
*Dir. Work Mgmt., OSF-2	S. Epler	— —	1 —
Dir. Communications, SOB.	R. DeSantis	— —	— —
*Document Center, NOB-2	S. Burkett	— —	1 —
*Document Control Desk		1 —	— —
Dosimetry, Serv. Bldg.	D. College	— —	— —
*EP – NDB, Trng. Bldg. #2	N. D. Brown	— —	1 —
*Emerg. Prep. Dept.	D. Light	1 —	— —
*EOF, Trng. Bldg.	R. Finicle	— —	1 —
*EP Drills, Trng. Bldg. #2	N. D. Brown	— —	1 —
ESD, Trng. Bldg..	R. Finicle	— —	— —
Environ. Affairs-Lab, Interstate Drive	D. Russ	— —	— —
Environ. Affairs-TMI, NOB-1 EPIP-TMI-.10	W. Ressler ✓	1 —	1 —
*Instructor Nuclear IV, Trng. Bldg. #2	R. Neff	1 —	— —
Logisitcal Support, Trng. Bldg..	R. Finincle	— —	— —
*NRC – Onsite, NOB-1	P. Sauder	— —	1 —
*NRC – Region 1, (Chief EP Section)	N. McNamara	— —	2 —
*PEMA – Bureau of Plans	D. Fleck	— —	1 —
Personnnel/Vehicle Monitor Kit Trng Ctr.	T. Berstler	— —	— —
*Plant Maint. (Library), Serv. Bldg.	N. Smith	— —	1 —
*Porter Consultants, Ardmore	S. Porter	— —	1 —
RLM, Rad Field Ops.	T. Berstler	— —	— —
Rad Con –RAC Locker, Rad Field Ops.	T. Berstler ✓ Both	— —	1 —
Rad Con –Kit 1 PC, Rad Field Ops. TMI-.10	T. Berstler ✓	— —	1 —
Rad Con –Kit 2 PC, Rad Field Ops.	T. Berstler ✓	— —	1 —
Rad Con –Kit 3 EOF, Rad Field Ops.	T. Berstler ✓	— —	1 —
Rad Con–Kit 4 EOF Bldg Rad Field Ops.	T. Berstler ✓	— —	1 —
Rad Con–Kit 5 EOF Bldg Rad Field Ops.	T. Berstler	— —	— —
Rad Con–Simulator Locker,Rad Field Ops	T. Berstler ✓ Both	— —	1 —
*Rad Engineers-U1, OOB	M. Wherry	— —	1 —
*Rad Instrument, Bldg. 159	J. L. Eckroth	— —	1 —
Radwaste/Chemistry, OOB-1	L. Ritter	— —	— —
Secondary Chem Lab-, OOB-1	L. Ritter	— —	1 —
*Security Mgr., PC	V. Handley	— —	1 —
Security U-1, PC	R. Goodrich	— —	1 —
*Simulator Room/File Copy, Trng.	D. Silar	— —	1 —
Simulator Room/Shift Supvs Office, Trng	D. Silar	— —	1 —
*Simulator Room/Working Copy, Trng.	D. Silar	— —	1 —
*TSC - Unit 1, OSF-113	C. Warlow	— —	1 —
*Training Dept., Trng	C. Flory	— —	1 —
*OSC, Rad Field Ops..	T. Berstler	— —	1 —
*Unit 1 Operations, OOB-1	L. Ritter	— —	1 —
*Vice President – TMI , OSF-2	P. J. Chevalier	— —	1 —
*Word Processing, OOB,No Stamp/Clip	A. Houseal	— —	1 —
RECORDS MGMT	S. Zimmerman	— —	— —

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AmerGen	TMI - Unit 1 Emergency Procedure	Number EPIP-TMI-.07
Title **Activation of the RAC**		Revision No. 9
Applicability/Scope All TMI RAC Emergency Response Personnel	USAGE LEVEL 2	Effective Date NOV 30 2000

This document is within QA plan scope	X	Yes		No
Safety Reviews Required	X	Yes		No

List of Effective Pages

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	Signature	Date
Procedure Owner	/s/ J. L. Whitehead	11/14/00
Approver	/s/ N. Brown	11/27/00

A045

1.0 **PURPOSE**

The purpose of this procedure is to provide guidelines for the Radiological Assessment Coordinator (RAC) to activate the radiological assessment function.

2.0 **APPLICABILITY/SCOPE**

This procedure is applicable to the TMI Radiological Assessment Coordinator and Radiological Support Personnel.

3.0 **DEFINITIONS**

None

4.0 **RESPONSIBILITIES**

4.1 The on-shift RAC is responsible for implementing Exhibit 1.

4.2 The Initial Response Emergency Organization (IREO) (RAC) is responsible for implementing Exhibit 2.

4.3 Radiological Support Personnel are responsible for implementing Exhibits 3 through Exhibits 5.

5.0 **PROCEDURE**

5.1 This procedure is to be initiated upon declaration of any Emergency Classification specified in the Emergency Plan or when directed by the Emergency Director.

5.2 Emergency Actions

NOTE

The steps in this section are based on the expected sequence of activation of the RAC. The actual sequence should be based on when qualified personnel arrive in the facility.

____ A. The on-shift RAC shall activate the radiological assessment function by reporting to the Control Room and performing the steps in the on-shift RAC checklist (Exhibit 1).

_____ B. The IREO RAC shall relieve the on-shift RAC and direct the radiological assessment function by assigning appropriate personnel to assume those positions and perform the actions listed for those positions as follows (in the absence of appropriate personnel, the Radiological Assessment Coordinator shall assume these positions and perform the essential actions for those positions):

_____ • Radiological Assessment Coordinator (RAC):

Report to Emergency Control Center and perform the RAC Checklist (Exhibit 2).

_____ • Radiological Engineering Support:

Report to the Emergency Control Center and complete the Radiological Engineering Support Checklist (Exhibit 3).

_____ • Radiological Line Communicator (RAC Support Staff):

Report to the Emergency Control Center and complete the Radiological Line Communicator Checklist (Exhibit 4).

_____ • RAC/OSC Communicator (RAC Support Staff):

Report to the Emergency Control Center and complete the RAC/OSC Communicator Checklist (Exhibit 5).

5.3 Final Conditions

_____ 5.3.1 The radiological assessment function is operational with the desired positions manned and functional. Communications are established.

5.4 Post Event Actions

_____ 5.4.1 An inventory of the RAC Area of the ECC is required to be performed by the end of the workday following the end of the event. The inventory is the responsibility of Rad Con Field Operations. Notify the Manager, Rad Con Field Ops. of the need to perform the inventory in accordance with Procedure TEP-ADM-1300.01, Maintaining Emergency Preparedness.

6.0 REFERENCES

6.1 TMI Emergency Plan

6.2 TMI Emergency Plan Implementing Procedures

6.3 6610-PLN-4200.02, Emergency Dose Calculation Manual (EDCM)

7.0 **EXHIBITS**

Exhibit 1 - On-Shift RAC Checklist

Exhibit 2 - IREO Duty Roster RAC Checklist

Exhibit 3 - Radiological Engineering Support Checklist

Exhibit 4 - Radiological Line Communicator Checklist

Exhibit 5 - RAC/OSC Communicator Checklist

EXHIBIT 1

On-Shift RAC Checklist

1.0 **The On-Shift RAC should perform the following until relieved by the IREO RAC or by a more senior qualified individual. This checklist need not be completed by the On-Shift RAC prior to turnover per Step 1.11.**

> **NOTE**
>
> **The bold underlined steps below are particularly important in the early stages of an emergency. They should be performed promptly and in an orderly manner.**

1.1 **Energize the RAC Computer.**

1.2 **Start a log** of activities performed.

1.3 **Call out additional resources** if they are needed. If no additional resources are needed at this time, skip the step but reconsider it later as needs change.

1.3.1 For the duty roster RAC, determine from the Emergency Director (ED) if the duty roster has been called out. If not, get the RAC's phone number from the ED and call him/her.

1.3.2 For call-out of additional R.C. Techs, obtain (or have someone obtain) phone numbers from the Rad Con Field Ops phone list and call (or have someone call) the needed techs.

1.4 **Determine release pathway.** Consult with the ED or his/her designee to determine the pathway of any radioactive releases from the plant.

> **NOTE**
>
> Refer to the Emergency Dose Assessment User's Manual section of the EDCM located in the RAC locker for guidance in performing dose projections.

1.5 **Obtain and validate the initial dose projection within 15 minutes.**

1.5.1 **Select the RAC Spreadsheet** icon from the desktop of the RAC Computer.

1.5.2 **Go to the release pathway** specified by the ED.

1.5.2.1 Select the Update Plant Data option to import PPM and Met Data.
1.5.2.2 If the pathway is being monitored by an RMS monitor, use the RMS option for that pathway.
1.5.2.3 If the pathway is not being monitored by an RMS monitor, use the leak rate option for that pathway.
1.5.2.4 Verify that the PPM and Met Data is current (15 minutes old or less). If not, all data will need to be input manually.
1.5.2.5 Enter data not available from the PPM as specified by the input sheet.
1.5.2.6 Edit any PPM or Met Data that is not believed to be accurate.
1.5.2.7 Print dose projection.

1.5.3 **Validate the dose projection** by performing the following checks:

- Verify that the correct release pathway is being used.
- Verify that the monitor input data is accurate and appropriate (e.g. no calibrations in progress).
- Verify the release duration with the ED.
- Verify that the dose projection results are consistent with other indications.

1.5.4 **Use the Total Dose Option** to verify no other pathways are contributing to the offsite dose.

1.5.5 **If power is lost to the RAC computer**, request assistance from Operations in obtaining power. An extension cord is available in the RAC locker.

1.6 **Review the dose projection with the ED.** Ensure the ED understands the nature of the dose projection (e.g. bounding calculation, contingency projection, "what-if", etc.) and the precision or uncertainty associated with the dose projection..

1.7 **Review the Emergency Classification with the ED** as it relates to current radiological parameters and evaluate the need to escalate to a higher classification.

1.8 **Advise the ED on any of the following** issues if they apply. Skip any that do not apply but reconsider them as the emergency conditions change.

- Protective Action Recommendations (PAR) (see the PAR logic diagram in procedure EPIP-TMI-.02, Emergency Direction, available from the ED).
- On-site assembly and site evacuation of non-essential personnel (see the table at the end of this exhibit for guidance).

> **NOTE**
>
> The automated Emergency Report Form that is produced by ED automatically suggests assembly location and evacuation routes contained on the table in this exhibit.

- Contaminated and/or injured employees and any decontamination efforts.

1.9 **Consider dispatching a field monitoring team** if the dose projection indicates the potential for abnormal radiological conditions off-site.

1.9.1 To activate field teams:

- Perform radio checks with the field team(s).
- Assign and record field team designations (e.g. Alpha, Bravo, etc.)
- Obtain and record names and SSN's for all field team members.
- Obtain and record year-to-date TEDE for all field team members.
- Inform team members of the current wind direction and speed and display it on the EPZ map.

1.9.2 **Field monitoring team placement and direction**: consider the following guidelines for placing and directing field team(s).

A. For ground level releases (highest doses projected at site boundary) -

- Place the first field team downwind at the site boundary.
- Place the second team (if dispatched) off-site, downwind and as near to the site as possible.

B. For elevated releases (highest doses projected at some distance from the site) -

- Place the first field team downwind at the location where the highest dose is projected.
- Place the second team (if dispatched) downwind nearer to the site than the first team (results from this team aid in determining if the plume touched down closer than projected).

C. Instruct the team(s) to scan across the plume and attempt to locate plume centerline.

- Provide a definite start point, direction of travel and an end point for scanning (e.g. "scan for plume centerline starting at NNE31, travel toward the Southeast passing through NE31 and continue to ENE31").

1.10 **BRP call back**: Within 45 minutes of event declaration notify the ECC Communications Coordinator whether the BRP has called back to the RAC.

1.11 **Provide a turnover to the IREO RAC** upon arrival.

EXHIBIT 1
On-Shift RAC Checklist

Guidelines for Selection of On-Site Emergency Assembly Area and Evacuation Route for Non-Essential Personnel

Wind Direction (from)	On-Site Emergency Assembly Area To Use	Route to Emergency Assembly Area	Gate To Be Used For Site Evacuation	Off-Site Remote Assembly Area To Be Used For Site Evacuation
1° to 80°	**Warehouse 1**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 use most direct route to Warehouse 1. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 travel by personal vehicle to Warehouse 1.	**North Gate**	**Training Center**
81° to 170°	**Warehouse 3**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 walk to Warehouse 3 via the East side of the plant. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 use most direct route to Warehouse 3.	**North Gate**	**Training Center**
171° to 240°	**Warehouse 3**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 should go directly to their personal vehicles and drive to the parking lot south of the Unit 2 Admin Bldg and then walk to Warehouse 3. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 should use the most direct route to Warehouse 3.	**South Gate**	**Training Center**
241° to 320°	**Warehouse 1**	**All site personnel** should take the most direct route to Warehouse 1.	**North Gate**	**Training Center or EOF (see Note)**
321° to 360°	**Warehouse 1**	**All site personnel** should take the most direct route to Warehouse 1.	**North Gate**	**Training Center**

NOTE

Use the Training Center as the Off-Site Remote Assembly Area unless the Dose Projection between the Exclusion Area Boundary and 1 mile is greater than 5 mREM/hr CDE or 1 mREM/hr TEDE.

EXHIBIT 2

IREO Duty Roster RAC Checklist

1.0 **The IREO RAC should perform the following upon reporting to the Emergency Control Center:**

_____ 1.1 **Obtain a turnover** from the On-Shift RAC if staffed. If the on-shift RAC position was not staffed skip to Step 1.2.

_____ 1.2 **Review Exhibit 1 and ensure applicable steps have been implemented.**

> **NOTE**
>
> The following steps should be considered and, if needed, implemented. These steps need not be performed in the sequence listed and may be performed multiple times. The RAC should periodically review this checklist to ensure that necessary steps are being performed.

_____ A. **Assign personnel to staff positions** described in Exhibits 3 through 5.

B. **Maintain a log** of activities performed.

C. **Refer to the Emer. Dose Assessment User's Manual** contained in the EDCM (Ref. 6.3) for dose assessment guidance.

D. Review dose projections with the ED.

- Ensure the ED understands the nature of the dose projection (e.g. bounding calculation, contingency projection, "what-if", etc.) and the precision or uncertainty associated with the dose projection.

E. Advise the ED on:

- Protective Action Recommendations (PAR) (see the PAR logic diagram in procedure EPIP-TMI-.02, Emergency Direction, available from the ED)
- On-site assembly and site evacuation of non-essential personnel (see the table at the end of this exhibit for guidance).
- Radiological conditions:
  - In-plant (including habitability concerns in emergency facilities),
  - On-site and
  - Off-site

NOTE

Consideration should be given to locations on-site where personnel may remain. Examples are:

- Security Posts
- Warehouses
- Communications
- Medical

- Employee doses and emergency dose extensions.
- Contaminated employees, decontamination efforts and any use of Thyroid Blocking agent.

F. **Emergency classifications:** Recommend emergency classifications to the ED based on radiological conditions and Emergency Action Levels (EAL).

G. **Fuel damage assessment:** Provide any necessary assistance to the TSC for the assessment of fuel damage and report results to the ED.

NOTE

While the RAC should provide assistance to the TSC in assessing the degree of core damage, the 'official' damage assessment values will be determined by the TSC.

H. **Primary to secondary leak rate determination:** If a primary to secondary leak exists, use the Emer. Dose Assessment User's Manual contained in the EDCM (Ref. 6.3) to assist in determining primary to secondary leak rate. Coordinate with the TSC in making this determination.

NOTE

While the RAC should provide assistance to the TSC in estimating the primary to secondary leak rate, the 'official' leak rate values will be determined by the TSC.

I. When the EACC is staffed turn over field monitoring teams to the EACC.

J. **Dose projection/field readings comparison**: use the following guidance for comparing field readings (field team or Reuter Stokes readings) and dose projections.

- If field readings are within a factor of 10 less than (and <u>not</u> more than) the corresponding projected value, a very good correlation exist between the two.
- Field iodine sample results, after being converted to thyroid dose rate (CDE per hour), can be directly compared to projected thyroid dose rate.

- Field team closed window dose rates and Reuter Stokes readings can be compared with DDE values in dose projections.
- There is no dose projection value that corresponds directly to field team open window readings. Open window readings that are higher than closed window readings indicate that the plume is at ground level at that location.

K. **Samples:** Consider the need for special samples (e.g. MAP-5, CATPASS, RCS-PAS) to provide more precise source term data for dose projections.

- Samples taken directly from the effluent pathway (e.g. condenser off-gas, MAP-5, etc) provide the most precise source term data.
- A sample from the Reactor Building atmosphere (i.e. CATPASS) will improve the precision of source term data for releases from the Reactor Building but will likely be less precise than effluent samples.
- RCS sample results are useful in determining the extent of fuel damage and can be used to improve the precision of the source term but to less an extent than effluent samples.

NOTE

The Emer. Dose Assessment User's Manual contained in the EDCM (Ref. 6.3) provides guidance on which sample(s) to obtain under various conditions.

____ L. **Communication with BRP:** Establish communication with the Bureau of Radiological Protection (BRP) and provide TMI dose projections to them.

____ M. **Communication with NRC:** If the NRC requests continuous communication on the Health Physics Network (HPN), establish and maintain communication on the HPN with them and:

- Assign an extra RAC staff member as soon as one is available or,
- Request an additional communicator from the ED Assistant.

N. Coordinate all Radiological Controls activities on-site, including:

- Access control to areas affected by the emergency.
- Personnel dose monitoring and control (including dose extensions).
- In-plant surveys and samples.

O. **Thyroid Blocking:** Implement the Thyroid Blocking procedure (EPIP-COM-.44) if it is anticipated that person(s) will be exposed to quantities of radioiodine sufficient to cause a thyroid dose of 25 REM (CDE) or greater.

P. Interface with the Group Leader- Radiological and Environmental Controls (GL-R&EC) regarding:

- Dose projections
- In-plant and on-site conditions
- Protective actions

Q. **Recommend source term reduction techniques** appropriate to the release pathway (e.g. RB spray, raising OTSG levels, etc). See the Emergency Dose Assessment User's Manual in Ref 6.3 for specific information.

R. Evaluate the need for eating and drinking restrictions in-plant.

- If results of habitability monitoring allow, recommend that the E.D. lift restrictions, as needed.
- Ensure habitability monitoring continues.

S. **Review radiological information in press releases**. Specific examples of radiological information that should <u>not</u> be included in press releases are:

- Dose projections
- Protective action recommendations
- Technical terms
- Acronyms and abbreviations

T. Trend effluent release data, RMS, sample results, field team readings and dose projections.

____ U. **Establish a watch bill** to cover the RAC and all staff positions on a 24 hour-per-day basis.

EXHIBIT 2
IREO Duty Roster RAC Checklist

Guidelines for Selection of On-Site Emergency Assembly Area and Evacuation Route for Non-Essential Personnel

Wind Direction (from)	On-Site Emergency Assembly Area To Use	Route to Emergency Assembly Area	Gate To Be Used For Site Evacuation	Off-Site Remote Assembly Area To Be Used For Site Evacuation
1° to 80°	**Warehouse 1**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 use most direct route to Warehouse 1. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 travel by personal vehicle to Warehouse 1.	**North Gate**	**Training Center**
81° to 170°	**Warehouse 3**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 walk to Warehouse 3 via the East side of the plant. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 use most direct route to Warehouse 3.	**North Gate**	**Training Center**
171° to 240°	**Warehouse 3**	Personnel in the **NOB, OSF, Protected Area** and other locations near Unit 1 should go directly to their personal vehicles and drive to the parking lot south of the Unit 2 Admin Bldg and then walk to Warehouse 3. Personnel in the **Unit 2 Admin Bldg, Bldg 222, Transportation** and other locations near Unit 2 should use the most direct route to Warehouse 3.	**South Gate**	**Training Center**
241° to 320°	**Warehouse 1**	**All site personnel** should take the most direct route to Warehouse 1.	**North Gate**	**Training Center or EOF (see Note)**
321° to 360°	**Warehouse 1**	**All site personnel** should take the most direct route to Warehouse 1.	**North Gate**	**Training Center**

NOTE

Use the Training Center as the Off-Site Remote Assembly Area unless the Dose Projection between the Exclusion Area Boundary and 1 mile is greater than 5 mREM/hr CDE or 1 mREM/hr TEDE.

EXHIBIT 3

Radiological Engineering Support Engineer Checklist

1.0 **Perform the following**:

> **NOTE**
>
> The following steps should be considered and, if needed, implemented. These steps need not be performed in the sequence listed and may be performed multiple times. The RESE should periodically review this checklist to ensure that necessary steps are being performed.

_____ A. **Start a log** of activities performed.

B. **Perform dose projections** using the RAC computer.

- **Refer to the Emergency Dose Assessment User's Manual** contained in the EDCM (Ref. 6.3) for guidance.
- **Validate dose projections.** Perform the following checks in coordination with the RAC:
  - Verify that the correct release pathway is being used.
  - Verify that the monitor input data is accurate and appropriate (e.g. no calibrations in progress).
  - Verify the release duration.
  - Verify that the dose projection results are consistent with other indications.
  - Verify that the PPM and Met data are not more than 15 minutes old.
- **If power is lost to the RAC computer**, request assistance from Operations in obtaining power. An extension cord is available in the RAC locker.

_____ C. **Determine and log the time of reactor shut down.**

D. **Communicate with the GL-R&EC and the EACC.**

E. **Trend dose projections.**

F. **Generate source term data**: Edit input parameters and input sample results to refine the source term.

G. **Met. and forecast data**: Obtain current meteorological data and weather forecast data (short and long term) from the EACC for:

- Dose projections (e.g. "what if" projections)
- Plume tracking
- Site evacuation planning
- Off-site protective action planning

H. Evaluate the following inputs to verify that dose projections reflect actual conditions:

- Plant conditions
- RMS data
- RCS activity
- Spiking factors
- Meteorological data.

I. **Confirm dose projections** by comparing with field team readings and/or Reuter Stokes readings.

- If field readings are within a factor of 10 less than, and not more than, the corresponding projected value a very good correlation exits.
- Field iodine sample results, after being converted to thyroid dose rate (CDE per hour), should only be compared to projected thyroid dose rate.
- Field team closed window dose rates and Reuter Stokes readings can be compared with DDE values in dose projections.
- There is no dose projection value that corresponds directly to field team open window readings. Open window readings that are higher than closed window readings indicate that the plume is at ground level at that location.

J. **Discuss Protective Action Recommendations (PAR) and Protective Action Guidelines (PAG) with the RAC.**

- The PAR logic diagram is contained in procedure EPIP-TMI-.02, Emergency Direction, available from the ED.

K. **Perform "what if" dose projections** based on potential or anticipated:

- Plant status changes
- Meteorological changes

L. **Coordinate with the TSC.** Assist the RAC in coordinating with the TSC for:

- **Primary to secondary leak rate determination.** Use the Emergency Dose Assessment User's Manual (Ref. 6.3) for guidance.

- **Fuel damage class determination.**

  - The TSC will produce the "official" damage class value.

  - Provide input using the guidance in Emergency Dose Assessment User's Manual (Ref. 6.3).

  - Update dose projection system as appropriate.

EXHIBIT 4

Radiological Line Communicator Checklist

1.0 Perform the following:

> **NOTE**
>
> The following steps should be considered and, if needed, implemented. These steps need not be performed in the sequence listed and may be performed multiple times. The Radiological Line Communicator should periodically review this checklist to ensure that necessary steps are being performed.

A. Maintain a log of information sent and received.

B. Communicate with the following:

- Group Leader - Radiological and Environmental Controls (GL-R&EC) at the EOF
- Bureau of Radiological Protection (BRP)
- Nuclear Regulatory Commission (on the HPN line).

C. Provide a briefing on current plant status and recent changes to all persons on the Radiological Line.

D. Pass requests from the RAC for off-site support to the EOF. Examples are:

- Rad Con Technicians from other plants.
- Equipment (e.g., radiation monitors, etc.)
- Whole Body Counting

____ E. If the NRC requests continuous communication on the HPN, establish and maintain communication on the HPN with them and request the RAC:

- Assign an extra RAC staff member to man the HPN as soon as one is available or,
- Obtain an additional communicator for the HPN from the ED Assistant.

EXHIBIT 5

RAC/OSC Communicator Checklist

1.0 Perform the following:

> **NOTE**
>
> The following steps should be considered and, if needed, implemented. These steps need not be performed in the sequence listed and may be performed multiple times. The RAC/OSC Communicator should periodically review this checklist to ensure that necessary steps are being performed.

A. Communicate between RAC and OSC

B. Communicate with the Remote Assembly Area Personnel

C. Maintain a Log of activities performed

D. Provide Event Update to Rad Con Personnel in OSC

E. Collect information on contaminated/injured personnel

F. Handle requests for:

- Activation of on/offsite field teams
- In-Plant Radiological data, (surveys - dose rates, contamination levels)
- Medical emergency information
- Search and Rescue Information
- Repair Team Information
- Vehicle/Personnel Contamination Surveys for Site Evacuation.

G. Interface for obtaining accident samples and sample results:

- CATPASS: Containment Atmospheric Post Accident Sampling System
- MAP-5: Particulate and Radioiodine Sample System on effluent pathways
- RCS PASS: Reactor Coolant System Post Accident Sampling System
- Radiation Monitoring System (RMS) samples for particulate, radioiodine, noble gas and tritium
- Other plant samples as required (OTSG, secondary)

EXHIBIT 5

H. Provide Guidance from RAC on in-plant radiological controls

- Keep OSC updated on events that may alter radiological conditions in the plant
- Radiation Controls - e.g., posting of Turbine Building

I. Obtain data on:

- Skin contaminations - levels and location of contamination
- Dose extensions - extension limits, purpose of extensions, personnel receiving extensions
- Personnel injuries - any radiological concerns

J. Provide priority from the RAC to the Chemistry Coordinator on accident samples and analysis.

FOR INFORMATION ONLY

AmerGen	TMI - Unit 1 Emergency Plan Implementing Document	Number EPIP-TMI-.10
Title **Onsite/Offsite Radiological/Environmental Monitoring**		Revision No. 10
Applicability/Scope TMI Division	USAGE LEVEL 2	Effective Date NOV 30 2000

This document is within QA plan scope	X	Yes		No
Safety Reviews Required	X	Yes		No

List of Effective Pages

Page	Revision	Page	Revision	Page	Revision	Page	Revision
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18	10						
19	10						
20	10						

	Signature	Date
Procedure Owner	/s/ J. L. Whitehead	11/14/00
Approver	/s/ N. Brown	11/27/00

1.0 PURPOSE

The purpose of this procedure is to provide guidance to radiological and environmental monitoring teams for adequate onsite and offsite monitoring of radiation, contamination and airborne radioactivity levels, and environmental sample procurement, following the accidental release of radioactive materials to the environment. The procedure establishes monitoring team actions necessary to obtain data required to make valid radiological assessments.

2.0 APPLICABILITY/SCOPE

All TMI Emergency Radiological and Environmental Monitoring Team Personnel.

3.0 DEFINITIONS

3.1 Derived Air Concentration (DAC) - The airborne concentration of radioactive material that if breathed by a worker for one hour, results in an estimated Internal Whole Body Dose (CEDE) of 2.5 mrem, or in the case of radioiodine, results in an estimated thyroid dose (CDE) of 25 mrem.

3.2 External Whole Body Dose (DDE) - The whole body dose from sources external to the body. Typically this is the dose recorded on a whole body TLD. Official term: Deep Dose Equivalent.

3.3 Internal Whole Body Dose (CEDE) - The estimated risk-based dose to the whole body resulting from the intake of radioactive material. Official term: Committed Effective Dose Equivalent.

3.4 Thyroid Dose (CDE(th)) - the dose to the Thyroid resulting from the intake of radioactive material. Official term: Committed Dose Equivalent - thyroid.

3.5 Total Whole Body Dose (TEDE) - the sum of the External Whole Body Dose (DDE) and the Internal Whole Body Dose (CEDE).

4.0 RESPONSIBILITIES

4.1 The Radiological/Environmental Monitoring Teams are responsible for implementing this procedure.

5.0 PROCEDURE

5.1 Implementation Criteria

5.1.1 This procedure is to be initiated upon the direction of the Emergency Director, the Radiological Assessment Coordinator (RAC), the Environmental Assessment Coordinator (EAC), or their designee.

5.2 Emergency Actions

NOTE

Team members utilize additional radiological precautions when approaching any of the following:

1. 4 REM Year-to-Date Total Whole Body Dose (TEDE).

2. 25 REM Thyroid Dose (CDE) during this event.

Minimize time spent in the plume especially in areas projected (by the RAC/EACC) to have high airborne radioactivity. Utilize protection such as thyroid blocking agent and/or respirators if advised by the RAC or the Env. Assessment Command Center (EACC).

INITIALS

_____ 5.2.1 Upon assignment as a monitoring team member, obtain emergency equipment and emergency vehicle.

5.2.1.1 Emergency Equipment consists of the following:

- Emergency Equipment/Instrument Kit (suitcase).
- Air Sampler.
- Portable Two Way Radio with spare battery.
- Respirators for Team Members.

_____ 5.2.2 Verify that the seal on the emergency kit was intact.

5.2.2.1 If the emergency kit seal was broken, conduct a brief inventory of the major pieces of equipment.

NOTE

There is no need to inventory a kit if its seal was intact.

_____ 5.2.3 Record the following information on Exhibit 6: 1) Name, 2) SSN, 3) Date, 4) Current Year-to-date Total Whole Body Dose (TEDE). Item 4 may be obtained from the Rem-on-Line System or may be transmitted via radio while the team is in transit to their first monitoring location.

_____ 5.2.4 Operationally check all radiation meters and portable air sampler (battery check, air flow check, visual inspection).

A. Obtain properly calibrated replacements for any meters or samplers found to be unsatisfactory.

INITIALS

B. Inform the RAC/EACC of equipment problems and, if needed, request assistance in obtaining replacements.

NOTE

If personnel intend to take air samples in areas inaccessible to vehicles (e.g., Shelley Island), a battery powered air sampler should be obtained for this purpose. A portable generator and an ordinary air sampler can be used if a battery powered air sampler is not available. Check the fuel level in the portable generator and operationally test it by running it momentarily.

_____ 5.2.5 Fill (or verify filled) the noble gas sampling devices (plastic bottles or marinelli beakers) with water prior to leaving the P.C. or EOF.

_____ 5.2.6 Issue self reading dosimeters (SRPDs or ESRDs) to team members.

_____ 5.2.7 Ensure each team member is wearing a TLD.

A. Team members responding from on-site should retain their TLD. Team members responding from the EOF should either retain their personal TLD (if available) or be issued a TLD from the supply of emergency TLDs at the EOF.

B. Use the individual dose log, Exhibit 6 to track each team member's dose.

C. At a minimum, each team member shall enter his/her SRPD/ESRD reading and time when he/she begins monitoring activities and again when he/she returns from the field.

D. SRPD/ESRD readings may be entered on the individual exposure log more frequently if a team member so desires (eg., when entering and leaving the plume).

E. Keep the RAC/EACC informed of field monitoring team doses.

- Advise the RAC/EACC if any team member's dose approaches:
  - 4 REM year-to-date total whole body dose (TEDE) or
  - 25 REM thyroid dose (CDE) during this event.
- Recommend that the RAC/EACC consider the need for team relief.

NOTE

Relief should be conducted in a low radiation area.

- Recommend that the RAC/EACC consider authorizing the use of thyroid blocking agent if field monitoring team thyroid doses are projected to be 25 REM (CDE) or greater.
- If the RAC/EACC authorizes the use of thyroid blocking agent, complete a copy of Exhibit 9 for each field team member.
- If the RAC/EACC advises the use of respirators, use extreme caution if operating a vehicle while wearing a respirator.

INITIALS

_____ 5.2.8 Ensure your survey meter is turned on.

NOTE

The survey meter should remain all times during the performance of monitoring team duties.

_____ 5.2.9 Perform radio check with the RAC/EACC (see Exhibit 10 for radio operating guidelines).

NOTE

Radio transmission may affect accuracy of portable instrument response. Information should not be transmitted while taking readings.

WARNING

Utilize roof top strobe light and vehicle's 4-way flashers whenever you are stopped along the road or travelling significantly slower than the speed limit.

INITIALS

_____ 5.2.10 Proceed to the designated monitoring point or other location as directed by the RAC/EACC. (See map in emergency kit for specifically designated monitoring point locations.)

NOTE

The following steps should be implemented as they are needed. These steps need not be performed in the sequence listed and may be performed multiple times. The Field Monitoring Team should periodically review these steps to ensure that necessary actions are being performed.

A. As time permits, keep a log of your major activities or the Major Activities log, Exhibit 7.

B. Perform radiological surveys/sampling as directed by the RAC/EACC at designated monitoring locations.

- Use the appropriate exhibit for the type of survey/sample requested:

  Exhibit 1 Radiation Surveys (including plume centerline scans).
  Exhibit 2 Radioiodine and Particulate Air Samples.
  Exhibit 3 Noble Gas Air Samples.
  Exhibit 4 Contamination Surveys.

C. If radio communications are lost, attempt to re-establish radio communications with the RAC/EACC. Move to higher ground if possible.

NOTE

If the portable radio displays "CC SCAN" this indicates that the radio is in a bad location or it is out of range.

- If radio communications cannot be re-established drive to the nearest telephone and call the RAC or the EACC (as appropriate). A list of important phone numbers is contained in Exhibit 8.

D. Minimize personnel exposures by moving out of areas of high radiation when counting samples, recording data or awaiting further instructions.

E. Ensure all team members keep track of their doses in Exhibit 6.

INITIALS

_____ F. Maintain all completed exhibits for permanent records.

G. Return all completed forms to Rad Con Coordinator at the OSC or other location as directed by the RAC/EACC.

_____ H. Retain all samples for later counting and analysis.

NOTE

Samples may be returned to the Rad Con Lab or designated collection point at a convenient time as directed by the RAC/EACC.

_____ I. When the Environmental Assessment Command Center (EACC) is activated and takes control of monitoring teams, begin reporting offsite surveys to the EACC.

_____ J. Upon relief or upon completion of monitoring duties, team members shall frisk themselves in a low background area and frisk the tires, seats, floor, and foot pedals.

- If any of the above are found to be greater than 100 CPM above background, inform the RAC/EACC and ask for instructions.
- Recommend to the RAC/EACC that the team be scheduled for a whole body count.

K. If requested by the RAC/EACC, initiate an RWP to cover the duties performed as a monitoring team at the completion of monitoring team activities (if not already done).

5.3 Additional Actions for Environmental Monitoring Teams

_____ A. Determine from the EACC the types of samples to be collected. The EACC shall also determine the location and frequency of collection.

_____ B. Collect and label all samples in accordance with environmental sampling procedures.

NOTE

Plastic disposable gloves shall be worn during the sample collection process.

_____ C. Return all samples to the EACC (or other location as specified by the EAC) for analysis and retention.

5.4 Final Conditions

INITIALS

____ A. Radiological/Environmental monitoring has been completed and all samples submitted for analysis/retention as directed by the RAC/EACC.

____ B. Field monitoring equipment has been returned to the location specified by the RAC/EACC.

____ C. If field team members have taken thyroid blocking agent, they should contact company designated medical personnel to determine how long they should continue to take it.

6.0 REFERENCES

6.1 6510-PLN-4520.01, Radiological/Environmental Monitoring Program Plan

7.0 EXHIBITS

7.1 Exhibit 1, Radiation Surveys

7.2 Exhibit 2, Radioiodine and Particulate Air Samples

7.3 Exhibit 3, Noble Gas Air Samples

7.4 Exhibit 4, Contamination Surveys

7.5 Exhibit 5, Radiation/Air/Smear Sample Log

7.6 Exhibit 6, Individual Dose Log

7.7 Exhibit 7, Major Activities Log

7.8 Exhibit 8, Important Telephone Numbers

7.9 Exhibit 9, Field Team Thyroid Blocking Agent Administration Form

7.10 Exhibit 10, Field Team Radio Operating Guidelines

EXHIBIT 1

Radiation Surveys

To perform radiation surveys:

> **NOTE**
>
> Sections A & B below should be implemented as needed based on direction from the RAC/EACC. These sections can be repeated as needed.

A. Plume centerline scans:

1. General Guidance:

   - Scanning is most effective when the team slowly travels across the plume at approximately a 90° angle to the wind direction.
   - Scanning should be performed with a frisker or a survey instrument. If a survey instrument is used, the probe window should be open.
   - In inclement weather, the instrument probe should be covered with a surgeon's glove or plastic bag to keep it dry.

2. Ask the RAC/EACC to specify a start and stop point for scanning. If the RAC/EACC provides no direction, consult the map and choose a route which runs as nearly perpendicular as possible to the expected plume direction.

3. Proceed to the start point with the survey instrument/frisker turned on.

4. Scan by driving slowly (~ 15 m.p.h.) while holding the instrument probe outside the vehicle.

5. Locate the point where the instrument reading is highest.

   5.1 Scan until the reading rises and then begins to decrease.

   5.2 Reverse direction and return to the location where the maximum reading was obtained.

   5.3 If the maximum reading persists for a definite distance (i.e., a tenth mile or greater), find the approximate midpoint of that distance.

6. Report the plume centerline location and maximum reading to the RAC/EACC. When reporting the location, give any landmarks which may help fix your location on a map (e.g., intersections, public buildings, streams, etc.).

7. Perform a stationary survey as described below unless directed otherwise by the RAC/EACC.

EXHIBIT 1

B. Stationary Surveys:

1. Ensure the probe window is closed and hold the instrument probe at waist level while standing outside the vehicle.

   - In inclement weather, the instrument probe should be covered with a surgeon's glove or plastic bag to keep it dry.

2. Obtain a reading by observing the instrument's needle for several seconds.

   - Mentally average the needle fluctuations to arrive at an average reading.

3. Obtain 3 readings per Step 2 above over a five minute period unless directed otherwise by the RAC/EACC.

4. Record the following in Exhibit 5.

   4.1 Record the 3 readings obtained per Step 3. If only 1 reading was taken, record it as "Reading 1".

   4.2 If 3 readings were taken, average them and record the average.

   4.3 Record the date, time and location of the reading(s).

5. Obtain one reading with the probe window open.

   5.1 Record the reading (in mR/hr) in Exhibit 5.

6. Report the location, time, average closed window reading and open window reading to the RAC/EACC.

EXHIBIT 2

Radioiodine And Particulate Air Samples

To perform air samples for Iodine and/or Particulate:

> **NOTE**
>
> If possible, load the air sampler with the Silver Zeolite cartridge and particulate filter prior to entering the plume.

1. Unscrew the filter and cartridge holder rings from the air sampler head and install a new Silver Zeolite cartridge and particulate filter.

   1.1 Ensure that the arrow on the side of the Silver Zeolite cartridge points toward the air sampler.

   1.2 Ensure that the particulate filter is installed such that the side of the filter which has a fibrous appearance is closest to the Silver Zeolite cartridge.

   1.3 Reassemble the air sampler head.

> **NOTE**
>
> The sampler flow rate, measure with both a particulate filter and a Silver Zeolite cartridge in place, is written on the air sampler's calibration sticker. The Silver Zeolite cartridge must be in place to ensure obtaining calibrated air flow rate even if an iodine sample has not been requested and the cartridge will not be analyzed in the field.

2. Ensure the following prerequisites and precautions are met:

   - The air sampler shall be placed outside the vehicle or in an open vehicle door or window.
   - Do not place the sampler on the ground or on known contaminated surfaces.
   - Keep the sampler away from vehicle exhaust gases.
   - Protect the sampler from rain and snow.
   - All samples shall be labeled and saved for further analysis.
   - Do not point the air sampler inlet toward any object which may restrict sampler air flow.
   - Do not stand directly in front of the sampler inlet when the sampler is running or allow loose clothing to restrict airflow.

3. Using the sampler's self timer (or a stopwatch or wristwatch if the sampler is not so equipped) draw a 300 liter (approximately) air sample.

   3.1 Use the table below and the sampler's posted flow rate to determine sampler run time. Sampler's with adjustable flow rate should be set to the highest flowrate possible not to exceed 50 lpm (1.8 cfm) and run for approximate time according to the table below.

Posted or Set Flow Rate	Sampler Run Time
≥ 19 < 21	15 minutes
≥ 21 < 25	13 minutes
≥ 25 < 29 lpm	11 minutes
≥ 29 < 32 lpm	10 minutes
≥ 32 < 36 lpm	9 minutes
≥ 36 < 40 lpm	8 minutes
≥ 40 < 46 lpm	7 minutes
≥ 46 < 50 lpm	6 minutes

> **NOTE**
>
> The RAC/EACC or their designee may direct that sampler run time be shortened to reduce time spent in the plume or to reduce the "lead time" in obtaining sample results or lengthened to provide better sensitivity in low concentration areas.

4. Fill out an air sample label with date, time, your name, location, air sampler run time, and air sampler flow rate.

   4.1 Also record this data on Exhibit 5.

5. To evaluate the Silver Zeolite cartridge in the field, perform the following steps:

   5.1 Obtain a general area background count rate with the E140N/HP260 pancake probe at approximately waist level.

      5.1.1 If the background is more than 200 cpm move to a location where background is acceptable (i.e. ≤ 200) and proceed with Step 5.2.

      5.1.2 If background is 200 cpm or less, go to Step 5.3.

> **NOTE**
>
> If you cannot find an area where background is ≤ 200 cpm, ask the RAC/EACC for advice.

   5.2 At the low background area run the air sampler for approximately 3 seconds to flush the cartridge.

5.3 Record the background count rate at the sample counting location on the sample label and on Exhibit 5.

5.4 Remove the cartridge from the sampler head and place it in a ziplock bag.

NOTE

Surgeons gloves should be used if the cartridge must be handled and contamination is expected.

5.5 Count both sides of the Silver Zeolite cartridge through the ziplock bag.

5.5.1 Record the higher count rate as "gross cpm" on the sample label and on Exhibit 5.

5.6 Subtract the background cpm from the gross cpm and record the result as "Net Cpm" on the sample label and on Exhibit 5.

5.7 Place the sample label in the ziplock bag and retain the sample for later analysis.

6. To evaluate a particulate filter in the field, perform the following steps:

6.1 Obtain a general area background count rate with the E140N/HP-260 pancake probe at approximately waist level.

6.2 If the background count rate is more than 200 cpm move to a location where background is acceptable (i.e. ≤ 200 cpm).

NOTE

If you cannot find an area where the background is ≤ 200 cpm, ask the RAC/EACC for advice.

6.3 Unscrew the filter holder section of the sampler head from the silver zeolite cartridge holder section such that the particulate filter is held in place in the removed section.

6.4 Obtain a gross count rate on the particulate filter by holding the collection side of the filter holder against the HP-260 pancake probe.

6.5 Record the count rate as gross CPM on the sample label and on Exhibit 5.

6.6 Unscrew the retainer ring from the filter holder and, using tweezers, remove the filter from the holder.

6.7 Place the filter in the coin envelope.

6.8 Place the coin envelope in a ziplock bag (if an iodine sample was taken, use the same ziplock bag).

6.9 Reinstall the retainer ring onto the filter holder and re-count the filter holder without the particulate filter in place.

6.9.1 Enter this count rate as Background CPM on the sample label and on Exhibit 5.

6.10 Subtract Background CPM from Gross CPM and record the results as NET CPM on the sample label and on Exhibit 5.

6.11 Place the sample label in the ziplock bag and retain the sample for later analysis.

6.12 Report the following information from the sample label to the RAC/EACC:

- Location
- Sample time
- Net cpm for both silver zeolite cartridge and particulate filter
- Run time
- Flow rate

EXHIBIT 3

Noble Gas Air Samples

To obtain noble gas air samples when directed by the RAC/EACC, proceed with Step 1 below:

1. Fill (or obtain a prefilled) clean container (500 ml [0.5 liter] or larger bottle or marinelli beaker) with clean water (i.e., not affected by plant release) (this can be done before going into the field).

> **NOTE**
>
> Field monitoring kit contains water filled plastic bottles for noble gas sampling.

2. When a sample is needed:

   2.1 Stand well away from vehicles or other obstructions.

   2.2 Pour the water from the container.

   2.3 Cap or close the container.

3. Label the sample container with the date/time of collection, and location.

4. Record the same information on Exhibit 5.

EXHIBIT 4

Contamination Surveys

To perform contamination surveys (if directed by the RAC/EACC):

1. Obtain smears and coin envelopes from the emergency kit, label envelope with date, time and location.
2. Wipe the smear over a 100 cm^2 area (4" x 4" area).
3. Count the background with the E140N w/HP-260 probe (or equiv.).
4. If background is greater than 200 cpm:
   - 4.1 Move to a location where background is ≤ 200 cpm.
   - 4.2 Re-count background and the smear.

> **NOTE**
>
> If you cannot find an area where the background is ≤ 200 cpm, ask the RAC/EACC for advice.

5. Count the smear with the E140N w/HP-260 probe (or equiv.).
6. Enter gross cpm and Bkg. cpm in Exhibit 5.
7. Subtract Bkg. cpm from gross cpm to obtain net cpm.
8. Enter net cpm on Exhibit 5.
9. Report location, time and net cpm for each smear to the RAC/EACC.
10. Save smears in coin envelope for later analysis as directed by the RAC/EACC.

EXHIBIT 5

Radiation/Air/Smear Sample Log

Note: Report only the data in the bold outlined boxes to the RAC/EACC

Location	Time	Open Window * E520 (mR/hr)	Closed Window E520 (mR/hr) or Frisker (cpm) Reading 1	Reading 2	Reading 3	Average	
						Air Sampler	
	Time	Sample Type	Gross CPM	Bkg CPM	Net CPM	Run Time	Flow Rate
		Iodine					
		Particulate					
		Smear					
		Noble Gas					

Location	Time	Open Window * E520 (mR/hr)	Closed Window E520 (mR/hr) or Frisker (cpm) Reading 1	Reading 2	Reading 3	Average	
						Air Sampler	
	Time	Sample Type	Gross CPM	Bkg CPM	Net CPM	Run Time	Flow Rate
		Iodine					
		Particulate					
		Smear					
		Noble Gas					

Survey Meter Type_____ Serial No._____ Cal. Due _____
Air Sampler Type_____ Serial No._____ Cal. Due _____
Counting Inst. Type_____ Serial No._____ Cal. Due _____
Technician_____

* Under normal circumstances, open window readings taken with the E-520 are recorded in cpm, however, during emergencies the mR/hr scale shall be used to permit the RAC/EACC to more easily compare the relative magnitudes of open window and closed window readings.

EXHIBIT 6
INDIVIDUAL DOSE LOG

Date: _____

NAME (PRINT)	SOC. SEC. #	YTD TOTAL WHOLE BODY DOSE (TEDE) (A)

	START TIME	BEGINNING SRPD/ESRD READING (B)	STOP TIME	ENDING SRPD/ESRD READING (C)	EXTERNAL WHOLE BODY DOSE (DDE) (D)	APPROX. THYROID DOSE (CDE) (E)*	APPROX. INTERNAL WHOLE BODY (CEDE) FROM IODINE (F)*	APPROX. TOTAL WHOLE BODY DOSE (TEDE) (G)	TOTAL THYROID DOSE (CDE) (H)
1					(C1-B1)			(A+D1+F1)	(E1)
2					(C2-B2)			(G1+D2+F2)	(H1+E2)
3					(C3-B3)			(G2+D3+F3)	(H2+E3)
4					(C4-B4)			(G3+D4+F4)	(H3+E4)
5					(C5-B5)			(G4+D5+F5)	(H4+E5)
6					(C6-B6)			(G5+D6+F6)	(H5+E6)

NAME (PRINT)	SOC. SEC. #	YTD TOTAL WHOLE BODY DOSE (TEDE) (A)

	START TIME	BEGINNING SRPD/ESRD READING (B)	STOP TIME	ENDING SRPD/ESRD READING (C)	EXTERNAL WHOLE BODY DOSE (DDE) (D)	APPROX. THYROID DOSE (CDE) (E)*	APPROX. INTERNAL WHOLE BODY (CEDE) FROM IODINE (F)*	APPROX. TOTAL WHOLE BODY DOSE (TEDE) (G)	TOTAL THYROID DOSE (CDE) (H)
1					(C1-B1)			(A+D1+F1)	(E1)
2					(C2-B2)			(G1+D2+F2)	(H1+E2)
3					(C3-B3)			(G2+D3+F3)	(H2+E3)
4					(C4-B4)			(G3+D4+F4)	(H3+E4)
5					(C5-B5)			(G4+D5+F5)	(H4+E5)
6					(C6-B6)			(G5+D6+F6)	(H5+E6)

* See for estimation method next page

EXHIBIT 6

NOTE

Notify the RAC/EACC when any team member approaches either of the following:

- 4 REM Year-to-Date Total Whole Body Dose (TEDE).
- 25 REM Thyroid Dose (CDE) during this event.

A rough approximation of the iodine derived air concentration (DAC), thyroid dose (CDE) and internal whole body dose (CEDE) can be obtained using the following relationship:

Every 1000 net cpm on the silver zeolite cartridge equals roughly:

- 20 DAC Iodine,
- 500 mREM/hr Thyroid Dose (CDE) and
- 15 mREM/hr Internal Whole Body Dose (CEDE)

For example: 5000 net cpm on the cartridge would roughly equal: 100 DAC Iodine, 2500 mREM/hr CDE and 75 mRERM/hr CEDE.

NOTE

1. This information is intended for field team use only and not for making dose projections for the public.
2. The relationships shown above are valid only if the sampler run times specified in the sampling instructions are followed.
3. The relationships are based on conservative assumptions (e.g. all iodine is I^{131}) and will in most cases overestimate the field team's dose. More refined estimates can be obtained from the RAC or EACC.

EXHIBIT 7

Page 1 of 1

Major Activities Log

Date_____

TIME	Major Activities/Remarks

EXHIBIT 8

Important Telephone Numbers

Location/Position			Phone Number
Control Room -	RAC		948-8525
	RAC		944-0382
OPS Support Center -	RCC/GRCS	Cellular	948-8248 ext. 5444
			948-8672
			948-8833
Processing Center -	Security		948-8038
Warehouse 1 -	Assembly Area		948-8248 ext. 5500
Warehouse 2 -	Assembly Area		948-8248 ext. 5042
EACC -	EAC/Met-Dose Coordinator		540-4501
EOF -	Group Leader R&EC		657-2097
Simulator (Drills Only) -	RAC		948-2063

EXHIBIT 9
Field Team Thyroid Blocking Agent Administration Form

Instructions:

1. Fill in the information below:

   Field Team Member's Name:

   Last_____First_____Middle Initial_____

   Social Security Number: _____ - _____ - _____

   Badge Number: _____

   Estimated Thyroid Dose (CDE): _____REM

   Name of the RAC/EACC who authorized use of thyroid blocking agent:

   _____

   Date and time of authorization: _____

2. Read the Thyroid Blocking Agent Precautions (Page 2 of this exhibit).

3. Decide if you should and are willing to take Thyroid Blocking Agent.

4. Record your decision below and sign/date this form.

NOTE
Although 10 CFR 20 allows up to 50 REM per year, EPA and FDA guidance recommend considering the use of thyroid blocking agent (KI) for acute exposures of 25 REM or greater (CDE) to the adult thyroid in order to maintain exposures As Low As Reasonably Achievable (ALARA).

I verify that I have read and understand the information on the Thyroid Blocking Agent Precautions sheet and understand that taking thyroid blocking agent is voluntary.

I also verify that I have no / have a (circle one) known allergy to iodine. If you have a known allergy to iodine you should not take thyroid blocking agent.

I accept / refuse (circle one) thyroid blocking agent.

_____/_____
Signature of Team Member Date

5. If you have decided to accept thyroid blocking agent:

   - Obtain thyroid blocking agent and drinking water from the field monitoring kit.
   - Take the initial dose of one (1) tablet.
   - Notify the RAC/EACC of this action.

EXHIBIT 9

HOW POTASSIUM IODIDE WORKS

Certain forms of iodine help your thyroid gland work right. Most people get the iodine they need from foods, like iodized salt or fish. The thyroid can "store" or hold only a certain amount of iodine.

In a radiation emergency, radioactive iodine may be released in the air. This material may be breathed or swallowed. It may enter the thyroid gland and damage it. The damage would probably not show itself for years. Children are most likely to have thyroid damage.

If you take potassium iodide, it will fill-up your thyroid gland with non-radioactive iodine. This reduces the chance that radioactive iodine will enter the thyroid gland.

WHO SHOULD NOT TAKE POTASSIUM IODIDE

The only people who should not take potassium iodide are people who know they are allergic to iodide. You may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or anti-thyroid drug). Pregnant and nursing women and babies and children may also take this drug.

HOW AND WHEN TO TAKE POTASSIUM IODIDE

Potassium Iodide should be taken as soon as possible after proper authorization is received. You should take one dose every 24 hours. More will not help you because the thyroid can "hold" only limited amounts of iodine. Larger doses will increase the risk of side effects. You will probably be told not to take the drug for more than 10 days. Contact company medical personnel to determine how long you should take potassium iodine.

SIDE EFFECTS

Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are told. Side effects are unlikely because of the low drug dose and the short time you will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people could have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body at times severe shortness of breath requiring immediate medical attention.

Taking iodide may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

WHAT TO DO IF SIDE EFFECTS OCCUR

If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide and contact the medical department.

EXHIBIT 10

Field Team Radio Operating Guidelines

NOTE
The following sections provide guidance for operation of the field team portable radios. Individual sections can be implemented as needed.

To operate the portable radio:

A. Turn on the portable radio by rotating the "power on-off/volume" knob clockwise. The radio will perform a "power up self test" and then display:

- Its unit number (e.g., "TMI P 1" is portable radio #1) and
- Either "EARS" or "CC SCAN" depending on whether the radio is receiving the system Control Channel signal (i.e., if "CC SCAN" appears, the radio is out of range or in a bad location).

B. To transmit:

- Make sure that "EARS" is displayed on the front of the radio and then press the Push-To-Talk (PTT) button (elongated button on the left side of the radio).
- When the short medium pitch beep is heard, begin speaking.
- If a high pitch beep is heard when the PTT is pressed, the system is temporarily busy. Don't release the PTT button - continue pressing it and wait for the short medium pitch peep before starting to speak. The delay should typically be not more than a few seconds.
- When speaking, hold the radio approximately 3 inches from the mouth and speak in a normal voice.

C. Receiving:

- When a call is being received the calling station's identity is displayed in the upper line of the radio's display.

D. System status beeps:

- The radio will indicate system status by emitting any of several beeps:
  - A short medium pitch beep indicates that the radio has begun to transmit and the user may begin speaking.
  - A high pitch beep indicates that all system channels are busy and the radio is waiting for the next available channel. The user should continue pressing the PTT button until a short medium pitch beep is heard and then begin speaking.
  - If five short high pitch beeps are heard while transmitting, this indicates that the radio is approaching its 60 second transmission length limit. Unless the radio is un-keyed before the long low pitch beep is heard, the radio will stop transmitting and information will be missed. Long transmissions should be broken into several shorter transmissions to avoid this.
  - A low pitch beep simultaneous with the appearance of a battery icon in the lower right corner of the display indicates that the battery voltage is low and the battery should be changed.

E. To replace the battery pack:

- Turn the radio off.
- Depress the recessed button beside the belt clip on the rear of the radio and slide the battery toward the bottom of the radio.
- Lift the battery up and away from the radio.
- To install a fresh battery pack: Align the tabs on the battery with the slots on the radio and slide the battery pack toward the top of the radio until it clicks.

F. The channel selector knob and the buttons on the front panel of the radio serve no function and should not be manipulated.