SECTION II - FUNCTIONS

PART K - RADIOLOGICAL EXPOSURE CONTROL

1. Purpose

This part describes exposure control for emergency personnel, contamination monitoring and decontamination of personnel and equipment, radioactive material control, and radioactive waste disposal.

2. Equipment

a. A personal dosimetry packet is issued to each emergency worker performing an emergency function inside the 10-mile Emergency Planning Zone (EPZ). Packets are stored at the Marshfield EOC. At the ALERT classification, each agency dosimetry coordinator reports to the EOC to obtain his/her agency's allocations. Sufficient dosimeters are available to supply each emergency worker with a packet. Additional supplies are available from MEMA Region II. Each Dosimetry packet contains the following:

(1) One low-range direct-reading Dosimeter (DRD) (0-200mR)

(2) One mid-range (DRD), 0-20 roentgens (R)

(3) One Dosimetry Life Record (DLR)

(4) One Emergency Worker Exposure (EWE) Form with instructions.

(5) One Neck Chain

In addition High Range DRDs (0-200R) are stored at the Marshfield EOC if needed, for instance to traffic/access control personnel and to Dosimetry Coordinators, as necessary.

(6) One 130mg tablet of Potassium Iodide (KI).

(7) One KI instruction sheet.

(8) One Dosimetry Information Briefing Card

Agency Dosimetry Coordinators distribute packets to individual emergency workers within their organization. Sufficient quantities of KI are retained by the Town Radiological Officer to provide each emergency worker with a 10-day supply. The additional KI could be distributed at the discretion of MDPH.

b. The DLR is not direct reading, but is more accurate than the DRD, and provides a permanent exposure record for the individual emergency worker. PNPS has contracted to process DLRs during an emergency on a 24-hour basis.

c. The DRD provides the wearer with a visual indication of external exposure to gamma radiation. The DRD is direct-reading by emergency workers in the field. The DRD documented readings provide a record (official dose and external exposure) in the event of an individual's DLR is lost or damaged.

d. The radiological dosimeter charger (CDV-750) is used to charge or "REZERO" the DRDs. The chargers will be kept at the dosimetry issuing points. Agency Dosimetry Coordinators are responsible for zeroing DRDs.

e. Calibrated survey meters contained in predistributed monitoring and decontamination kits are used to determine the presence of contamination. The CDV-700 survey meter is used to locate and quantify external radioactive contamination on personnel or equipment (in the open window mode), to detect potential internal thyroid contamination (in the closed window mode), and to measure dose rates in low intensity radiation fields.

f. Supply and maintenance of radiation monitoring and personnel dosimetry equipment is discussed in Part H of this plan.

3. Reading, Reporting and Recordkeeping

a. Emergency workers will read their DRD's upon issuance and record the initial readings on the Emergency Worker Exposure Form. Dosimeters are read every 15 minutes unless otherwise directed.

b. Emergency workers report a DRD reading of 100 millroetgen (MR) on their 0-200mR DRD to their Agency Dosimetry Coordinator who in turn reports to the Town Radiological Officer. Emergency Workers will make their next DRD report if they observe a DRD reading of 175mR. 175mR is the initial DRD limit which cannot be exceeded without MDPH approval.

c. The DRD limit for all emergency workers may be adjusted by MDPH during the emergency. If this occurs, emergency workers will continue to report DRD readings at 1R increments on their 0-20 DRD up to the new limit.

d. The exposure received from each mission is entered on the Emergency Worker Exposure Form and the cumulative exposure maintained. The Emergency Worker Exposure Form is kept with the emergency worker for the duration of the emergency and contains information and instructions on recording exposure readings, PAG limits, and use of KI.

e. The Dosimetry Coordinator responsible for issuing dosimetry keeps a log of equipment issued, and continually tracks the accumulated emergency worker dose. The dosimetry logs are updated when doses are reported to the Dosimetry Coordinator.

f. Records are kept of personnel and equipment monitored, and any decontamination efforts that occur.

g. After the emergency has ended, copies of completed dose records, equipment log sheets, personnel and equipment monitoring and any decontamination efforts are forwarded from the originators through the organization until copies of all documents are received by the Massachusetts Department of Public Health (MDPH).

4. Radiological Exposure Limits

a. Emergency response procedures are designed to prevent or minimize exposure for emergency workers. Actions include methods such as rotation of tasks to minimize worker exposures by carefully monitoring individual exposure accumulations. Also, non-radiologically related tasks (e.g., data recording, communications) are performed outside of radiation areas, whenever possible.

b. With each DRD reading reported, the Agency Dosimetry Coordinator and emergency workers supervisors must consider whether the mission being performed is essential to public safety. Rotation of workers should be encouraged to the extent possible. The DRD limits should not be construed as "license" to incur radiation exposure unnecessarily. Radiation exposure should always be kept As Low As Reasonably Achievable (ALARA).

c. An individual emergency worker may need to exceed the DRD limit established for all workers in order to save lives or in order to protect large populations or valuable property. This requires specific authorization from MPDH for total exposures exceeding 5 REM.

The Town RO will request this authorization through the MEMA Region II RO. If authorization is not granted, the emergency worker would be directed to leave the area. If authorization is granted, MDPH will establish a DRD limit for exposure.

d. The town Radiological Officer will inform the MEMA Region II Radiological Officer of the significant radiological events and any implementation that is being carried out. Follow-up information will be provided to the MEMA Region II Radiological Officer who will relay such information to the Massachusetts Department of Public Health at the MEMA Headquarters in Framingham.

5. Thyroid Exposure Limits

a. If the thyroid dose to emergency workers is projected to exceed the precautionary measures recommended by MDPH, emergency workers who may be exposed are instructed to take potassium iodide (KI). This decision is made to allow sufficient time for maximum effectiveness of potassium iodide (KI).

b. Potassium Iodide, the most commonly used thyroid blocking agent, saturates the thyroid with non-radioactive iodine to block uptake of radioactive iodine. KI is stored in the town for distribution to emergency workers. The MEMA supplies a sufficient complement of KI tablets in each town to allow for distribution to emergency workers promptly upon the recommendation from the MDPH Commissioner or designee. Each blister pack of KI tablets placed in the Town dosimetry kits is checked semi-annually and carries a warning concerning the side effects associated with the use of KI. Emergency workers who use dosimetry are advised of the side effects of KI in training courses and receive an instruction sheet with KI at the time of distribution.

6. Contamination Monitoring and Decontamination

a. Emergency workers are monitored for contamination when they have been in potentially contaminated areas, when dosimeters indicate radiation exposure, or when such monitoring is requested by the individual. All vehicles and equipment potentially contaminated shall be monitored. Monitoring is performed at the Regional Emergency Worker Monitoring and Decontamination Station located at the Erwin K. Washburn Primary School in Carver.

b. Personnel designated to perform emergency worker contamination monitoring and decontamination are provided with contamination monitoring instruments, as well as decontamination and radioactive material control supplies and necessary documentation forms. These items are maintained in kits specifically designed to support their function, along with the specific instructions for the care and use of the equipment. The kits are kept at the Regional Emergency Worker Monitoring and Decontamination Station in Carver, MA.

c. All Emergency Worker Monitoring and Decontamination Stations are equipped to decontaminate individuals, vehicles and equipment found to have contamination levels greater than 100 CPM above background. Any person reading greater than 100 CPM above background on a thyroid screen will be referred to a hospital for evaluation. (Figure K-2)

d. Personnel performing monitoring and decontamination activities will segregate, contain and identify (through radiological signs and barriers), contaminated items. These activities are monitored by MDPH personnel. The collection and handling of radioactive waste from decontamination is coordinated by MDPH and provided by the PNPS who will ensure proper disposal at the end of the emergency.

e. The training course given to emergency workers providing radiological monitoring and decontamination includes sections on personnel, vehicle and equipment monitoring and decontamination methods.

7. Medical Support and Treatment Facility

a. Designated hospitals (see Section II L-1) will decontaminate the following:

(1) Mobility impaired persons transported by ambulance or other specialized vehicle.
(2) Persons with open wounds
(3) Persons who can not be decontaminated below 100 CPM above background in two attempts.

b. All persons reading greater than 100 CPM above background thyroid will be sent to designated hospitals for evaluation and treatment of radioactive iodine uptake.

Figure K-1

RADIOLOGICAL EXPOSURE CONTROL ORGANIZATION

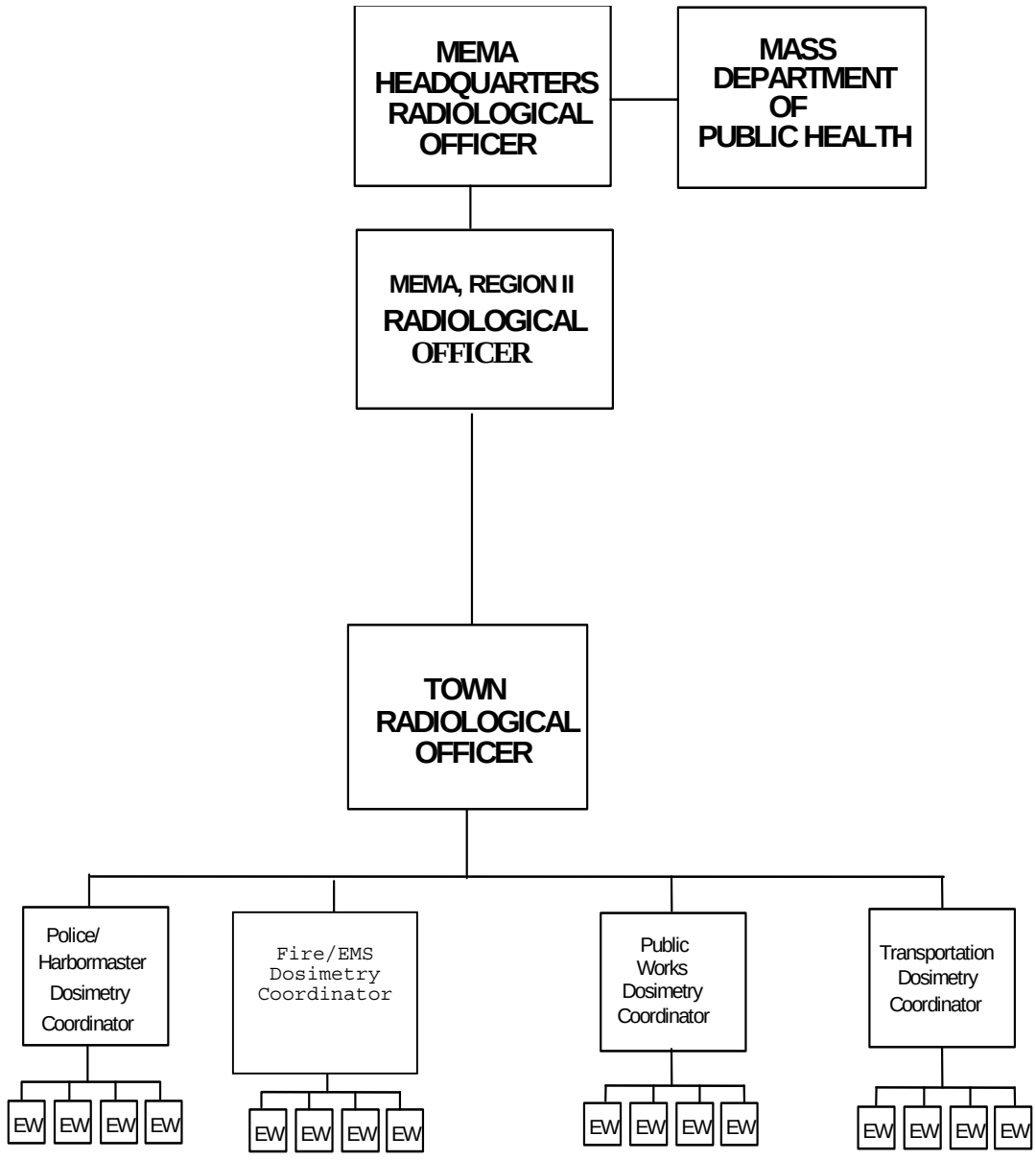

Figure K-2

Contamination Levels & Required Actions

Subject	Levels	Actions
Decontamination Area	100 CPM	Restrict access to authorized personnel only; if levels exceed 100 CPM Above background, rope off area and move decontamination activities to different location.
Equipment/Vehicles	100 CPM	At this level or higher/isolate for decontamination/ disposal
Skin	100 CPM	At this level or higher, attempt to decontaminate. If unable to reach this level after two decontamination attempts, refer to hospital for medical evaluation.
Thyroid	100 CPM	At this level or higher refer to hospital for medical evaluation.
Clothing	100 CPM	At this level or higher, isolate for decontamination/ disposal.

Note: These levels are measured above background and area applicable only to incidents at nuclear power stations. Readings below these levels require no action. Levels for equipment/vehicles, skin and clothing are based on open window readings using the CDV-700 Instrument. The thyroid level would be based on closed window reading.