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<b>Effective Date:</b>	March 17, 2014
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<b>Rescinds Directive Number:</b>	D2002-03, C2000-01

## PEMA Directive

**Subject:**

Radiological Preparedness Program

**Scope:**

Radiological Officers, Radiological Instructors, and related radiological personnel.

**Distribution:**

- www.pema.state.pa.us
- County Coordinators
- Chiefs of State-Certified HMRTs
- County Radiological Officers
- County Commissioners
- Various state agencies

**By Direction of:**

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Director, PA Emergency Management Agency

### I. PURPOSE

To provide agency staff and county elected officials and their emergency management coordinators with guidance concerning the federal, state, and county radiological preparedness program. The minimum age for radiological responders is 18. Radiological instructors must be 23 years of age (allowing for 5 years of experience).

### II. REFERENCES

- A. State Emergency Operation Plan and applicable supporting plans
- B. Commonwealth Radiation Protection Act 147-1984 as amended
- C. Modular Emergency Response Radiological Transportation Training (MERRTT)/Radiological Response Training, United States Department of Energy (DOE), April 2013 and its successors
- D. REP-2, Guidance on Off-Site Emergency Radiation Measurement Systems, Phase 1-Airborne Release, Federal Emergency Management Agency (FEMA), Rev 2, June 1990 and its successors
- E. REP-5, Guidance for Developing State, Tribal, and Local Emergency Response Planning and Preparedness for Transportation Accidents, Rev. 2, FEMA, June 1998 and its successors

**Comments and Questions Regarding this Directive Should be Directed to:**

Alan Brinser, Bureau of Planning and Preparedness, Technological Hazards Division, 717-651-2217

- F. REP Program Manual, FEMA, June 2013 and its successors
- G. NUREG-0654, FEMA Rev. 1, Criteria for Preparedness and Evaluation of Radiological Emergency Plans and Preparedness in Support of Nuclear Power Plants, Nuclear Regulatory Commission (NRC)-FEMA, Rev 1, November 1980 and its successors
- H. Environmental Protection Agency (EPA) 400-R-92-001, Manual Of Protective Action Guides and Protective Actions for Nuclear Incidents, EPA, May 1992 and successors (see EPA webpage <http://www.epa.gov/radiation/docs/er> for current information as well as Planning Guidance for a variety of radiation/nuclear incidents)
- I. National Incident Management System (NIMS), December 2008 and its successors
- J. National Response Framework (NRF) / Nuclear Radiological Annex, June 2008 and its successors
- K. Pennsylvania State Fire Academy Instructor Classification System and Code of Professionalism, Policy 2001-01 July 1, 2001, revised March 13, 2013 and its successors
- L. Pennsylvania Emergency Management Services Code, 35 Pa. C.S., 7101-7707 as amended
- M. Hazardous Materials Emergency Planning and Response Act, 165 of 1990 as amended
- N. 49 Code of Federal Regulations (CFR) Parts 170-189 (USDOT)
- O. 10 Code of Federal Regulations (CFR) Parts 71 & 73 (USNRC)
- P. United States Department of Transportation (DOT), Emergency Response Guidebook, current edition
- Q. DOE's Emergency Response Flatsheet, current edition

### **III. GENERAL**

- A. Relevant concerns include radioactive material licenses at fixed facilities, the increasing transportation of radioactive materials, the widespread medical uses of radioisotopes, and the threat of terrorism. There is a need to ensure that emergency response is capable of preserving the public's safety during a potential radiological hazard incident.

- B. Counties have a responsibility to develop a program with adequate capability to monitor potentially contaminated areas, establish a safe perimeter, initiate decontamination procedures, and appropriately contact PEMA for the coordination and response of state and federal agencies.
- C. Generally, it is the responsibility of elected officials to ensure that sufficient trained staff is available to respond to emergencies of any kind including radiological and nuclear incidents when needed. In practice, most elected officials rely on the emergency management agency within their jurisdiction to provide this assurance.
- D. After conducting a hazard assessment, including radiological hazards such as medical isotope/radiopharmaceuticals transportation, food/medical/commercial irradiators, orphan sources, abandoned facilities, Spent Nuclear Fuel (SNF) transportation, escorted shipments, construction, pipe inspection, fracking, density gauges, road construction, etc., counties should identify the number of trained staff necessary to ensure public safety (Refer to IV. Radiological Preparedness Training). The guidelines are general so that each county and state agency is able to develop planning annexes and a radiological plan reflecting their needs and resources.
- E. The recruitment of volunteers throughout our society has become more difficult. To meet the counties' needs, the following sources may be considered for radiological response training:
  - 1. Volunteer staff
  - 2. Paid staff
  - 3. Personnel from local industries
  - 4. Personnel from local hospitals
  - 5. County based, state certified hazardous materials team
  - 6. Contracted certified hazardous materials team

#### **IV. RADIOLOGICAL PREPAREDNESS TRAINING**

- A. The Modular Emergency Response Radiological Transportation Training (MERRTT), developed by DOE and a consortium of states, provides a flexible, comprehensive, radiological transportation response training course. The Radiological Response Training Modules found in the Fundamentals Course for Radiological Response (G-320), developed by FEMA, are directed toward all-hazards, radiological response approach and address proper response activities for nuclear power plant emergencies, industrial radiological incidents, radioactive materials reentering the atmosphere, and nuclear/radiological terrorism. Both federal training programs utilize the modular training concept; however, counties need to review their hazard assessments to determine which radiological training program they should use for their county responders.

Training needs vary based on the differing hazards, various categories of response personnel, and county locations. The training requirements for each are outlined separately in this Directive. Categories of radiological personnel to be trained are Radiological Officers (RO), Radiological Response Teams (RRT), and Radiological Instructors (RI).

- B. Counties are responsible for keeping records of all response personnel within their jurisdiction trained in radiological safety.

PEMA will provide certificates of training for all persons who successfully complete the designated Radiological Officer course (G-320). DOE will provide certificates to those who complete the MERRTT/RRT courses.

Counties should annually review personnel training requirements for initial and refresher courses in all radiological categories. Those requiring PEMA assistance should contact their PEMA Area Office.

C. Specialized Training

1. Enhanced/Advanced Radiological Training. Selected radiological emergency response personnel who have completed, as a minimum, the RRT training may be nominated to attend the FEMA Radiological Emergency Response Operations (RERO) and Advanced Radiological Incident Operations Courses (ARIO) conducted at FEMA's Center for Domestic Preparedness (CDP) Noble Training Center, Anniston, Alabama; various Weapons of Mass Destruction (WMD)/Radiological courses offered at CTOS/Nevada Test Site; the Technician Level T-MERRTT; and the 40 hour Radiation Specialist Course given in the field by DOE. Other prerequisites may apply. Refer to the National Preparedness Directorate's course catalog for course description and available dates. All nominees for the courses must receive the endorsement of the State Training Officer at PEMA.

2. Medical Radiation Training. The following courses are available to specific persons whose performance of radiological safety duties would be enhanced by their attendance:

- a. Specialized Medical Services Training is available for medical personnel who must prepare for the treatment of radiologically contaminated victims. Nurses, doctors, and technicians, particularly those near reactors and transportation routes, are encouraged to take the following courses: FEMA IS-346 *Orientation to Hazardous Materials for Medical Personnel* (<http://training.fema.gov/EMIWeb/IS/is346.asp>), and FEMA G-346 - *Hospital Emergency Department Management of Radiation Accidents (Indirect Delivery), Radiological Emergency Response for Emergency Medical Services Personnel* and DOE

courses conducted at Oak Ridge National Laboratories (ORNL) or by the Radiological Emergency Assistance Center/Training Site (REAC/TS) mobile cadre (<http://www.ornl.gov/reacts>). Designated MS-1 hospitals should take advantage of MS-1 specific training provided through PEMA. Periodically, the Armed Forces Radiobiology Research Institute provides the *Medical Effects of Ionizing Radiation (MEIR) Course* via a mobile training team or in residence (<http://www.usuhs.edu/afrrri/outreach/meir/meir.htm>). All nominees for these courses must receive the endorsement of the State Training Officer, PEMA.

- b. Emergency Medical Service (EMS) training concerning the emergency transportation of contaminated victims and radiological safety for hospital emergency room personnel is available through FEMA and DOE. The “*Emergency Management of Radiation Accident Victims*” mobile course is provided by REAC/TS periodically. Transportation incident workshops using FEMA and DOE MERRTT and C-MERRTT materials, and federal and state instruction personnel are also recommended and available.

D. Basic Radiological All-Hazards Protective Response Categories

Within the emergency response structure of each Pennsylvania county, a core of radiological personnel should be trained to provide the capability to respond to any type of localized radiological emergency. ROs who work directly with the county coordinator should lead these personnel.

1. Radiological Officers (RO)

- a. Every county should have an adequate number of PEMA recognized ROs who are immediately available to provide a 24 hour capability for response to radiological emergencies. Counties should consider having an EMA staff member qualified as an RO. Prerequisites are:
  - i. County RRT member for one year, and
  - ii. Must have completed a FEMA RERO, PEMA Radiological Officers Development in Emergency Operations (RODEO), or County REP radiological tabletop, functional, or full scale field radiological hazardous material exercise to be eligible to attend the RO Initial Course (G-320 - referenced later in this Directive); and
  - iii. RO candidate must complete and provide documentation that he or she has completed a DHS approved Incident Command System (ICS) 100 and 200 level course to comply with NIMS guidelines, FEMA Independent Study Course IS-700 - *National Incident Management System*,

IS-800b - *National Response Framework*, as well as successfully completed an ICS 300 course. In addition, the RO candidate must complete IS-301 - *Radiological Emergency Response*. The IS programs may be found at: <http://training.fema.gov/IS/crslist.asp>. The ICS 300 is a field delivered classroom seminar.

Waiver requests on the RO course prerequisites must be submitted in writing through the respective PEMA Area Office.

- b. It is a goal of the Pennsylvania Radiological Program that each county have three (3) trained RO personnel designated to support the county Emergency Operations Center and/or to respond to accidents/incidents involving radioactive materials within their county. In counties not classified as nuclear power plant risk and support counties, this may be accomplished through mutual aid with neighboring counties until adequately trained ROs are available within the county. This will fulfill the "Additional Personnel for Hazmat Teams" recommendation found in PEMA Emergency Management Directive D-2010-2 (and successors), Hazardous Materials Response Teams in Pennsylvania. The Emergency Management Training Function in the Annual Statement of Work also references this requirement. The identified county ROs will not be counted toward meeting the county's RRT requirement.
  - c. A minimum of one RO is necessary to assist the county's RRT during a radiological incident.
  - d. RO training will be conducted by a certified, PEMA approved, FEMA/PEMA/DOE Radiological Instructor (RI). PEMA will establish and maintain records of trained, active ROs and RIs. Names of all county trained ROs must be provided to their respective PEMA Area Office during the annual statement of work visit or at least once before the end of the federal fiscal year. The Area Office will provide a copy to the PEMA Radiological Emergency Preparedness (REP) Program.
2. Radiological Response Team (RRT) Members
- a. Every county should have an adequate number of RRT members trained to respond to radiological emergencies. Personnel sources for recruitment as identified in Section III should be considered.
  - b. It is a recommendation of the Pennsylvania Radiological Program that each county have at least four (4) trained RRT personnel to respond to accidents/incidents involving radioactive materials within their county. This will also fulfill the "Additional

Personnel for HAZMAT Teams” recommendation found in PEMA Directive 2010-2 and successors.

- c. As a prerequisite, candidates enrolling in an RRT course must have completed, and provide documentation that they have completed, a DHS approved Incident Command System (ICS) 100 and 200 level course to comply with NIMS guidelines and Pennsylvania Governor’s January 2005 proclamation as well as successfully complete FEMA Independent Study Course IS-700 - *National Incident Management System* and IS-800b - *National Response Framework*. RRT Candidates must complete IS-3 - *Radiological Emergency Management*. Courses can be found at <http://training.fema.gov/IS/crslst.asp>.
  - d. RRT in-class training must be conducted by PEMA approved FEMA/PEMA/DOE certified RIs.
  - e. Counties should establish and maintain records of their trained, active team members. Names of all county-trained RRT members must be provided to their respective PEMA Area Office during the annual statement of work visit or at least once before the end of the federal fiscal year. The Area Office will provide a copy to the PEMA REP Program.
3. Radiological Instructor (RI)
- a. A cadre of RIs will be endorsed by PEMA. Individuals interested in becoming qualified RIs should contact the PEMA Bureau of Planning and Preparedness.
  - b. An RI must be properly trained and be recognized by PEMA.
  - c. Prerequisites: RRT, RO courses already discussed or have current and active RO status prior to the date of this Directive. In addition, the candidate must have taken the State Fire Academy adult education methodology course or its equivalent. All RIs must successfully complete FEMA Independent Study (IS) Courses IS-100, IS-200, IS-700 *National Incident Management System* and IS-800b *National Response Framework*. Finally, the qualifying course for instructors is the FEMA/CDP PER-908-1 - *Radiological Series Train the Trainer Course* (Rad T-t-T).

PEMA endorsed RIs are qualified to conduct FEMA G-346 *Hospital Emergency Department Management of Radiation Accidents*, RRT (MERRTT), and RO (FEMA G-320 *Fundamentals Course for Radiological Response*) courses. DOE has approved all Pennsylvania RIs listed in the PEMA and FEMA

databases as qualified to deliver the DOE MERRTT modules. (Note: Personnel are instructed on the MERRTT material at FEMA's Radiological Series, T-t-T course.)

- d. Each year, PEMA provides to Pennsylvania Educational Training Agencies (ETA), such as community colleges and the State Fire Academy, a list of PEMA endorsed RIs for use as contract instructors for radiological training. Only those who have met the minimum instructor requirements, including Educational Methodology (EMLL or equivalent), can be recorded on the State Fire Academy list.

#### 4. Surge Training

- a. To respond to the extraordinary requirements that may exist during a radiological incident, counties must rely on surge training to augment their trained staff. During periods of increased readiness or nuclear power plant incidents, surge radiological training may be conducted to provide needed additional personnel. Such personnel may include:
  - i. Radiological briefers, who perform municipal RO tasks such as performing a radiological briefing, issuing dosimetry and KI, initiating and tracking radiological paperwork, and reporting exposure and dosimetry readings under the supervision of the county RO in municipalities without trained ROs
  - ii. Radiological monitors, who operate radiological meters and monitors at planned or added monitoring positions
- b. Surge training will consist of basic instruction in job specific requirements such as delivering a radiological briefing, assigning dosimetry or the use and operation of the assigned radiological instruments. The instruction will include:
  - i. A radiological briefing – risk and risk management
  - ii. Familiarization with and operational procedures of the survey meter, dosimeter and dosimeter charger
  - iii. Personnel monitoring procedures
  - iv. Protective Action Guides (PAG) including sheltering, evacuation and the use of Potassium Iodide (KI)
  - v. Decontamination and exposure records
  - vi. Reporting procedures
  - vii. Reactor impacts, status releases and recovery

- c. Surge training should be conducted by qualified radiological personnel, e.g., any available RI, RO, RRT member or other qualified radiological personnel. A Radiological Briefer in municipalities without a trained RO should be surge trained by a county RO. Surge training should be completed within approximately two hours.

## **V. RADIOLOGICAL TRAINING TIMELINE FOR INITIAL AND REFRESHER COURSES**

### **A. Radiological Officer (RO) Initial/Refresher Courses**

1. The prescribed RO initial course material to be utilized is the FEMA *Fundamentals Course for Radiological Response* (FEMA G-320). This is an intense three (3) day, twenty-four (24) hour course. As a prerequisite, all persons enrolling in an initial RO course must have successfully completed the RRT time criteria and exercise requirements.
2. All qualified ROs must complete an eight (8) hour PEMA Radiological Officer Refresher (ROR) course every two (2) years.
3. Certain radiological continuing education and identified commonwealth or federal courses may be substituted for the PEMA Radiological Officer Refresher Course. Eligible substitutions for the ROR Course are listed in section V. D. below.

### **B. Radiological Response Team (RRT) Initial/Refresher Training**

1. The primary prescribed RRT initial course is the 16-module DOE MERRTT Course. The timeline allotted for the DOE MERRTT Course, Modules 1-16 and five (5) practical exercises, is currently 16 hours.
2. Emergency responders responsible for hazmat response and who have met 29 CFR 1910.120 requirements, are eligible for the State Fire Academy *Initial Hazmat RRT* course, using the applicable modules of the DOE MERRTT Course through the use of the State Fire Academy's approved Radiological Hazardous Material Minimum Standard Accreditation. The prescribed timeline allotted for an Initial Hazmat RRT course is currently 8 hours, provided their county EMA office certifies the completion of the required hazmat operations level training. For those counties that will use the FEMA Modules, the course time length is 8 hours, and prior county approval is also needed for the hazardous materials track.
3. RRT refresher training must be completed every two (2) years for recertification. The DOE 8 hour Compressed MERRTT (C-MERRTT) will qualify as the refresher course. Certain radiological continuing education and identified commonwealth or federal courses can be

substituted for the DOE C-MERRTT / PEMA RRT Refresher Course. Eligible substitutions for RRT Refresher Course are listed in section V. D. below.

**C. RI Initial & Refresher Requirements**

1. The prescribed RI course is the FEMA *Radiological Series Train-the-Trainer Course* (Rad T-t-T), currently offered at the CDP Noble Training Site. The timeline allotted for this course that covers instructing the G-320, G-346 and MERRTT course is 32 hours.
2. In addition to the *Train the Trainer Course*, an RI must complete the FEMA prerequisites for Rad TtT, the State Fire Academy's adult Educational Methodology Course (or its equivalent), and apply for PEMA instructor status with the Fire Academy.
3. An RI should conduct at least one radiological course each year to maintain proficiency. Each instructor must meet and maintain instructor classification in accordance with the requirements outlined in the Pennsylvania State Fire Academy Instructor Classification System and Code of Professionalism, Policy 2001-01 (revised 3/13/2013) or its successors.

**D. Acceptable RRT and RO Refresher Substitutes**

(unless otherwise noted, these classes will apply to both ROs and RRT Members)

1. Pennsylvania Emergency Management Agency  
(See Pennsylvania State Fire Academy Course Catalog also)
  - a. PEMA RRT Refresher Course – RRT Member level only
  - b. PEMA RO Refresher Course
  - c. PEMA (or FEMA) sponsored Radiological Officer Development in Emergency Operations (RODEO)
2. DHS-Federal Emergency Management Agency  
(<http://www.training.fema.gov>)
  - a. PER- 904 – Radiological Emergency Response Operations (RERO) Course (CDP)
  - b. PER - 905 - Advanced Radiological Incident Operations (ARIO) Course (CDP)
  - c. IS-302 - Modular Emergency Radiological Response Transportation Training (MERRTT) (allowed 1 time in 4 years)
  - d. G-320 - Fundamentals Course for Radiological Response (FCRR)
  - e. E-304 - Radiological Emergency Preparedness Exercise Evaluation
  - f. E-340 - Radiological Emergency Planning Course
  - g. E-341 - Radiological Accident Assessment Concepts (RAAC) Course (G-341)
  - h. Radiological Series T-t-T (CDP)

3. DHS/DOE National Nuclear Security Admin. (NNSA), National Center for Exercise Excellence (NCEE), Nevada Test Site (NTS)
  - a. WMD Radiological/Nuclear Responder Operations
  - b. WMD Radiological/Nuclear Course for Hazardous Material Technicians
  - c. WMD Radiological/Nuclear Awareness Train-the-Trainer (T-t-T) Course
  
4. DOD Defense Threat Reduction Agency, Defense Nuclear Weapons School  
([http://www.dtra.mil/cs/dnws/cs\\_site\\_index.html](http://www.dtra.mil/cs/dnws/cs_site_index.html))
  - a. R-001 - Nuclear Weapons Orientation Course
  - b. R-003 - Radiological Command & Control Coordination
  - c. R-005 - Radiological Emergency Team Operations (RETOPS)
  - d. R-006 - Joint Nuclear Explosive Ordinance Disposal Course
  - e. R-010 - Proliferation Terrorism & Response Course
  - f. R-015 - Medical Effects of Ionizing Radiation (same course that AFRRRI teaches)
  - g. R-016 - WMD Command, Control, and Coordination
  - h. R-018 - Hazard Prediction & Assessment Capability Advanced Course
  - i. R-019 - Nuclear Research & Operations Officer Course
  - j. Annual 3-day WMD Symposium (course number changes each year)
  - k. Joint DOD/DOE Nuclear Surety Executive Course (course number changes each year)
  
5. Armed Forces Radiobiology Research Institute  
(<http://www.usuhs.edu/afrrri/outreach/meir/meir.htm>)

Medical Effects of Ionizing Radiation (MEIR) Course
  
6. DOE - Transportation Emergency Preparedness Program (TEPP)  
(<http://www.em.doe.gov/otem/program.html>)
  - a. MERRTT
  - b. Technician MERRTT (T-MERRTT)
  - c. Radiation Specialist Modular Emergency Radiological Response Transportation Training
  - d. Compressed MERRTT (C-MERRTT). This 8 hour course may only be used as a refresher for the RRT Member level.

If courses are taken in a state other than Pennsylvania, attendee must show which modules were taken.

7. DOE - REAC/TS  
(<http://www.ornl.gov/reacts/courses.htm>)
  - a. Handling Radiation Emergencies by Emergency Department Personnel
  - b. Health Physics in Radiation Emergencies
  - c. Medical Planning and Care in Radiation Emergencies

## **VI. TRAINING REQUESTS**

All Training Requests for National Preparedness Directorate Catalog Courses, including Emergency Management Institute (EMI), the Center for Domestic Preparedness (CDP), and the National Training and Education Division (NTED) in-residence training are submitted through the State Training Officer at PEMA using FEMA Form 119-25-1 (dated 2012). Information on other federal courses and locally delivered "G" courses can be obtained by contacting the State Training Officer, PEMA.

## **VII. RADIOLOGICAL RESPONSE PERSONNEL QUICK REFERENCE**

A matrix by position is attached to this Directive as a quick reference for prerequisites and course work for ROs and RRTs.

## **VIII. RESCISSION**

**Emergency Management Circular Number C2000-1 and Emergency Management Directive Number D2002-3 are hereby rescinded with this Directive.**

Attachment      Matrix by Position

**ATTACHMENT**  
**Matrix by Position**

<b>POSITION</b>	<b>Prerequisites</b>	<b>Training Requirements</b>	<b>Refresher Requirements</b>	<b>Refresher Options</b>
<b>Radiological Response Team (RRT) Member</b>	-Complete ICS-100, 200, 700, 800 (current versions) -Complete IS-3 Radiological Emergency Management	SFA – RRT Initial Course / 16 hour MERRTT Course	SFA - RRT Refresher Course / 8 hour C-MERRT, IS-302 MERRTT (no more than once in two refresher cycles), 16 hour MERRTT or any higher level radiological training course as listed below.	See RO training, refresher and chart below
<b>Radiological Officer (RO)</b>	-Serve as an RRT for a minimum of one year -Complete RERO, PEMA RODEO, County REP Rad tabletop or a full scale field radiological hazardous material exercise -Complete ICS-100, 200, 300, 700, 800 (current versions). -Complete IS-301 Radiological Emergency Response	SFA- RO Initial Course/FMEA G-320 Fundamentals Course for Radiological Response	SFA – RO Refresher Course, IS-302 MERRTT (no more than once in two refresher cycles), 16 hour MERRTT, FEMA G-320 Fundamentals Course	See chart below
<b>Other Refresher Options for ROs and RRT Members</b>	RERO, ARIO, Rad Series T-t-T, WMD Radiological/Nuclear Course for Hazardous Material Technicians, WMD Radiological/Nuclear Reponder Course, WMD Radiological Nuclear Awareness Train the Trainer Course, DOE T-MERRTT, DOE Rad Specialist MERRT course, PEMA RODEO, Fundamentals Course for Radiological Response, REP Planning Course, REP Exercise Evaluation Course and approved DOD Defense Threat Reduction, Armed Forces Radiobiology Research Institute and REAC/TS courses			