ROSS Quarterly Call

16 September 2025

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Agenda

- Welcome from FEMA Office of Emerging Threats (OET)1 ROSS Program Manager – Jeramie Calandro
- Welcome from CRCPD ROSS Program Manager – Bill Irwin, ScD, CHP, FEMA Type 1 ROSS
- New MissionEdge and Cadre Management trainings with follow-up videos – Angela Leek, PhD, CHP, FEMA Type 1 ROSS
- Topical Training: NCRP Guidance for Emergency Responder Dosimetry – Bill Irwin
- Closing Remarks – FEMA OET

FEMA Office of Emerging Threats

Welcome and Opening Remarks

Jeramie Calandro

Source: GAO. | www.gao.gov

https://www.gao.gov/products/gao-19-164 accessed 2/23/23.

FEMA OET Updates

- ResRad Training for ROSS
- Emergency Management Assistance Compact (EMAC)
- CTOS PER-388
  - Orlando, Florida the week of 9/30
  - Canyon, Texas the week of 10/13
  - Brooklyn, New York the week of 11/21
- CTOS VEST

CRCPD Homeland Security/ Emergency Response Committee 4 (HS/ER-4) Update

Bill Irwin, ScD, CHP, FEMA Type 1 ROSS, CRCPD ROSS Program Manager

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Questions? william.Irwin@vermont.gov

Major Happenings This Summer!

- ROSS trained at CDC to teach a three-day Public Health Decision Making During A Radiation Emergency course.
- ROSS serving at DOE/FBI tabletop courses
- Advancing State ROSS Programs
- Mentoring states on EMAC Mission Ready Package development
- Survey of ROSS on training interests
- My favorite topic: new Type 1, 2, and 3 ROSS candidates before the Qualification Review Board

ROSS trained at CDC to teach a three-day Public Health Decision Making During A Radiation Emergency course

- The CDC has developed an exceptional training course.
  - I personally believe it will be as good as the CTOS Virtual Evaluation Scenario Training (VEST).
- It develops further the capabilities for ROSS support of decision makers in response to a nuclear detonation introduced in CTOS' PER-388.
- Type 1 ROSS Adela Salame-Alfie is the CDC and CRCPD lead for this project.

Adela Salame-Alfie
NuRaC.llc@gmail.com
salamealfie8@gmail.com

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3-Day Course

Objectives

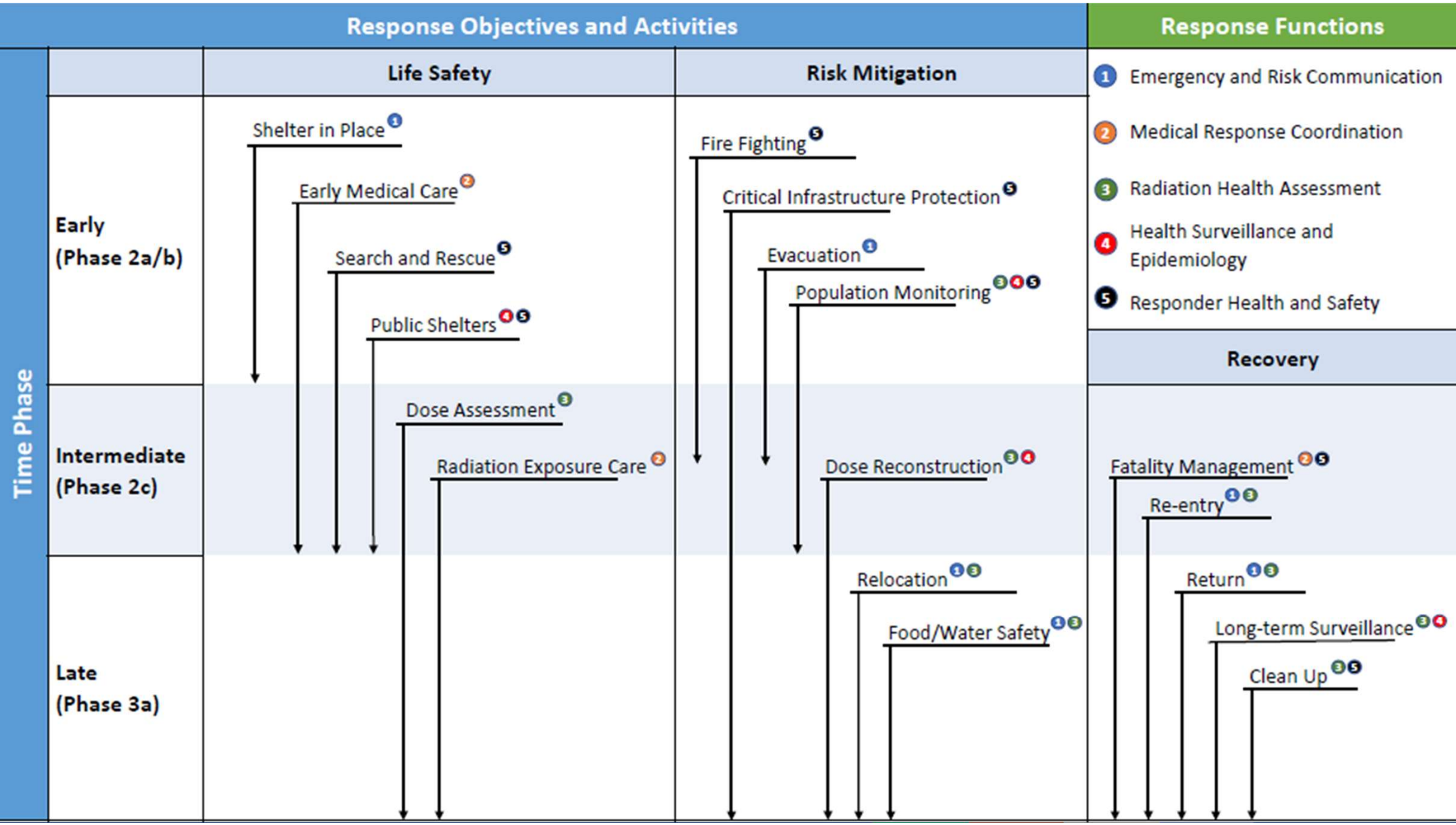
- Discuss public health (PH) responsibilities related to nuclear/radiological response.
- Identify key PH decisions in a nuclear/radiological response.
- Identify resources to support PH decision making in a nuclear/radiological response.
- Develop capacity to make key PH decisions in a nuclear/radiological response.
- Recognize the role of partner agencies in a nuclear/radiological response.

Prerequisites

- Understanding of radiation concepts, IND response

Course Structure

- Two days of didactic training with group activities
- Covers early, intermediate and late phases
- Focuses on life safety, risk mitigation and recovery
- 18 modules ranging from shelter-in-place/evacuation to fatality management, dose reconstruction, early medical care, long-term surveillance, relocation/return/recovery
- Day three is a full day Capstone Exercise


Response Objectives and Activities
Response Functions
Time Phase
Life Safety
Risk Mitigation
Early (Phase 2a/b)
Intermediate (Phase 2c)
Late (Phase 3a)
Shelter in Place
Early Medical Care
Search and Rescue
Public Shelters
Dose Assessment
Radiation Exposure Care
Fire Fighting
Critical Infrastructure Protection
Evacuation
Population Monitoring
Dose Reconstruction
Relocation
Food/Water Safety
1 Emergency and Risk Communication
2 Medical Response Coordination
3 Radiation Health Assessment
4 Health Surveillance and Epidemiology
5 Responder Health and Safety
Recovery
Fatality Management
Re-entry
Return
Long-term Surveillance
Clean Up

Thanks to all the ROSS who volunteered to become trainers

- Mike Firsick (CT)
- Amy Hass (MN)
- Mohamed Musa (OR)
- Shelly Stancil (GA)
- Trae Windham (TX)
- Abria Grimmett (AL)
- Bill Irwin (VT)
- Tanya Ridgle (CA)
- Nancy Stanley (NJ)
- Juan Garcia (CA)
- Angela Leek (IA)
- Jason Smith (MI)
- Blain Workman (AR)

- To top it off, the course was taught by four other ROSS:
  - Adela Salame-Aldie
  - Andrea Pepper
  - Jim Hardeman
  - Sherwin Levinson

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Initial planning for teaching the course nationally is under way

- The CDC and CRCPD are working to use the seventeen people trained and providing the training in July to teach the course perhaps four times over fiscal year 2026 which starts October 1.
- Hopefully, we can get three ROSS trainers together at a site where multiple municipalities, counties, and states can send students to learn how to support decision-makers in their jurisdictions.
- If we send ROSS to class locations, we can maximize the CDC-provided travel funding.
- Local ROSS would be invited as students as well as others, and every ROSS helping could get signed off on hard-to-obtain PTB tasks related to nuclear detonation.
- Look for more information coming soon!

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Thanks to ROSS serving at DOE/FBI tabletop courses

- Cathy McLellan of Pennsylvania served as a ROSS at the Department of Energy's (DOE) Isotope Crossroads radiological transportation exercise in Pittsburgh on 20 August.
- Alex Dawson of Michigan represented the ROSS in Macomb, Michigan in the Federal Bureau of Investigation (FBI) Community Unified Radiological Response Incident Exercise (CURRIE) on 9 September.
- Dustin Willett of South Dakota is deploying to Anchorage, Alaska to share the ROSS mission there in a Silent Thunder tabletop exercise on 25 September.
- Trae Windham of Texas is deploying to Idaho Falls, Idaho for a Silent Thunder exercise related to the Qal-Tek Corporation facility there,

Thanks to the ROSS on CRCPD Committee HS/ER-4 who help us deploy ROSS!

- Angela Leek of Iowa and Nancy Stanley of New Jersey are the Section Chief and Group Supervisor of our State Support Section that helps recruit ROSS for these and other exercises.
  - They prepare and send out the deployment requests and help select the best candidates for deployment and connect the ROSS with the Point of Contact for exercise logistics.
- We do our best to meet multiple objectives:
  - Provide the requesting jurisdiction ROSS with the best skillset for the exercise.
  - Provide ROSS meaningful training experiences in the exercise.
  - Use the available travel funding as efficiently as possible.

Thanks too, to the many ROSS out there who volunteered to deploy but were not chosen to deploy for these exercises.

- The Department of Energy has since 2014 generously supported the travel of many ROSS to training exercises
- Over our brief history, we have sent more than one hundred ROSS to close to one hundred exercises including many national level full scale exercises like Vibrant Response, Southern Crossing, Gotham Shield and Cobalt Magnet and even more tabletop exercises.
- Usually, the DOE and FEMA have provided the travel funding.
- Over our brief history, our travel funding dries up.
- Unfortunately, our travel funding for ROSS has dried up again.

We will once again have to rely on other travel funding sources

- Iowa, Connecticut, Nebraska, Arizona, and Rhode Island have provided travel funding to bring ROSS to their nuclear power plant Radiological Emergency Preparedness (REP) Program exercises.
- We have also had some states pay for the ROSS' travel needs.
- We have even had several ROSS provide their own travel funds.
  - Many have lived near the exercise venue, but some have flown to distant states!
- We will have to again rely on some of these approaches.
- As with the other times where travel funds dried up, the well eventually is replenished and we can obtain partner funding again.

And then there is the fish, er shrimp, story…

- On the August ROSS Steering Committee (FEMA, DOE, DHS, CRCPD) call, Jeff Chapman who is deeply engaged in the investigation of the radioactively contaminated shipping containers asked how we could deploy ROSS to help.
- We discussed it a bit and realized that the rapid deployment of ROSS outside their home state using EMAC is time-consuming.
- We could do it, but it is not as rapid deploying out of state ROSS as we would like.

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This pointed to a needed solution

- Further discussions within the CRCPD HS/ER-4 Committee landed on:
  - We need to develop rapidly deployable ROSS for in-state response and rely on EMAC for out-of-state ROSS and the later deployments.
- This pointed to the next steps:
  - We must continue strengthening the state ROSS organizations.
  - States need more ROSS with each State working toward at least one Type 1 or 2 ROSS to help lead ROSS either where a single ROSS is deployed or where a strike team or task force of ROSS is needed.
  - CRCPD HS/ER-4 needs to help the State ROSS Coordinators with these efforts since it is all done without direct funding in budgets.

We also need to mentor states on EMAC Mission Ready Package development

- Over the last eight months, CRCPD HS/ER-4 has learned a lot about EMAC Mission Ready Packages (MRP) from California ROSS and CTOS Instructor Greg Funderburk.
- They are essential to mutual aid, both inside states but especially between states, but they are also a bit complicated and require support by specific Emergency Management authorities.
- They describe the resources a state can provide when requested through EMAC, the costs associated with those people if deployed, liabilities associated with the individuals deployed (care and insurance), and the travel expenses for travel, lodging, meals and incidentals.

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Mentoring states on EMAC Mission Ready Package development

- They can be filled out beforehand to some degree, for example with points of contact, the names of individual ROSS by type, etc.
- They also must be maintained, for example for specific salaries, fringe and indirect costs of ROSS and for the exact current travel expenses for them.
- For these reasons, CRCPD HS/ER-4's State Support Section will be providing individual support to each state.
  - First, as they embark on creating the foundation half of the MRP that can be developed now, and
  - Second, to give them the awareness about building the second, more time-sensitive half of the MRP during the hours when a mutual aid request has been made.

The Mission Ready Package Provides the Documentation for ROSS

- It is a set of worksheets (tabs) in an Excel workbook that itemize the commonalities as well as the specific differences among resources.
- The commonalities are efficiently handled by having one MRP for each ROSS Type (1, 2, 3 or 4).
- Here is page 1 of 5 of the MRP worksheet for a Type 1 ROSS.
- It comes in large part from the FEMA ROSS Position Description.

NIMS Category:	Fire and Hazardous Mate	**Kind:**	Personnel	**Type:**	Type I
Components:	Personnel, Reference Resourses, Computing and Communications Equipment				
Metrics:					

6. Identify Emergency Support Functions (ESFs) Supported:

ESFs 5, 8, 10, 11, 15

7. Mission Capabilities:

Provides subject-matter expertise and guidance on issues related to radiation, the environment, hazard modeling, data and risk management, public protective actions.

8. Detailed Resource Description:

Provides subject-matter expertise and guidance regarding radiation, the environment, hazard modeling, data and risk management, public protective actions and other scientific/technical issues to incident response leaders at any level. Gathers, organizes, synthesizes, documents and distributes incident and resource information to improve situational awareness at all levels of incident management. Is able to clearly explain the implications of modeling, measurement and analysis methods, as well as the health risks and hazards that exist during a radiological or nuclear incident. May function as a ROSS Strike Team/Taskforce Leader. See FEMA's Resource Typing Definition for Response Situational Assessment for additional information.

9. Resource is:	Mobile (has transportation component built

10. Space and Size Requirements Needed to Carry out Mission:

EOC and Incident Facility Assignments: Single personnel work station (table, chair, 110v electrical power).

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The Mission Ready Package Provides the Documentation for ROSS

- The differences are handled by entering the specific facts about each of the ROSS by type in different tabs of the workbook.
- There are worksheets (tabs) for Travel Costs, Personnel Salaries and Fringe Benefits, Equipment (for us, mostly computers and communications), and Commodities (office supplies, fuels, water, snacks, ice, etc.).
- Here is the one of the more complex worksheets, that for travel expenses.

Assisting State Emergency Management Mission Reference Number:				0		
Resource Provider Tracking Number:				(Unique information entered for each individual MRP)		
Total Travel Costs:				$ -		
Enter Detailed Travel Costs Below:						
Personal Vehicle:						
Personal vehicle rates are calculated by the mileage rates available at www.gsa.gov. Mileage rate includes fuel & wear/tear on vehicle.		Mileage	Mileage on Mission Site	Return Mileage	Rate Per Mile	Total:
						$ -
Rental Vehicle:						
Rental vehicle fee includes the rental rate and fuel.	Vehicle Rental	Insurance (optional)	Total Purchase Cost for Fuel (must submit receipts for reimbursement)			Total:
						$ -
Governmental Vehicle Costs:						
Governmental vehicle costs are for only fuel. Costs for wear/tear on vehicle should be expensed under "Equipment".			Total Cost for Government Vehicle Use (must submit receipts for reimbursement)			Total:
						$ -
Total Air Travel:						
Price of air ticket includes cost to and from mission site.		Cost for Air Travel Ticket(s):	Additional Fee Not Included in the Ticket Purchase Price			Total:
						$ -
Meals/Tips:						
	Total Meal Expense:	Total Meal Expense plus tips (must submit receipts for reimbursement)				Total Actual Meals/Tips
						$ -
While traveling to and from or while on a mission,	Daily Per Diem Rate:	Per Diem Rate	# of Days @ Rate	# of Personnel	Meals/Tips at Per Diem Rate	Total Pier Diem Meals/Tips
					$ -	
	Daily Per Diem Rate:	Per Diem Rate	# of Days @ Rate	# of Personnel	Meals/Tips at Per Diem Rate	
					$ -	
		Per Diem Rate	# of Days @ Rate	# of Personnel	Meals/Tips at Per Diem	

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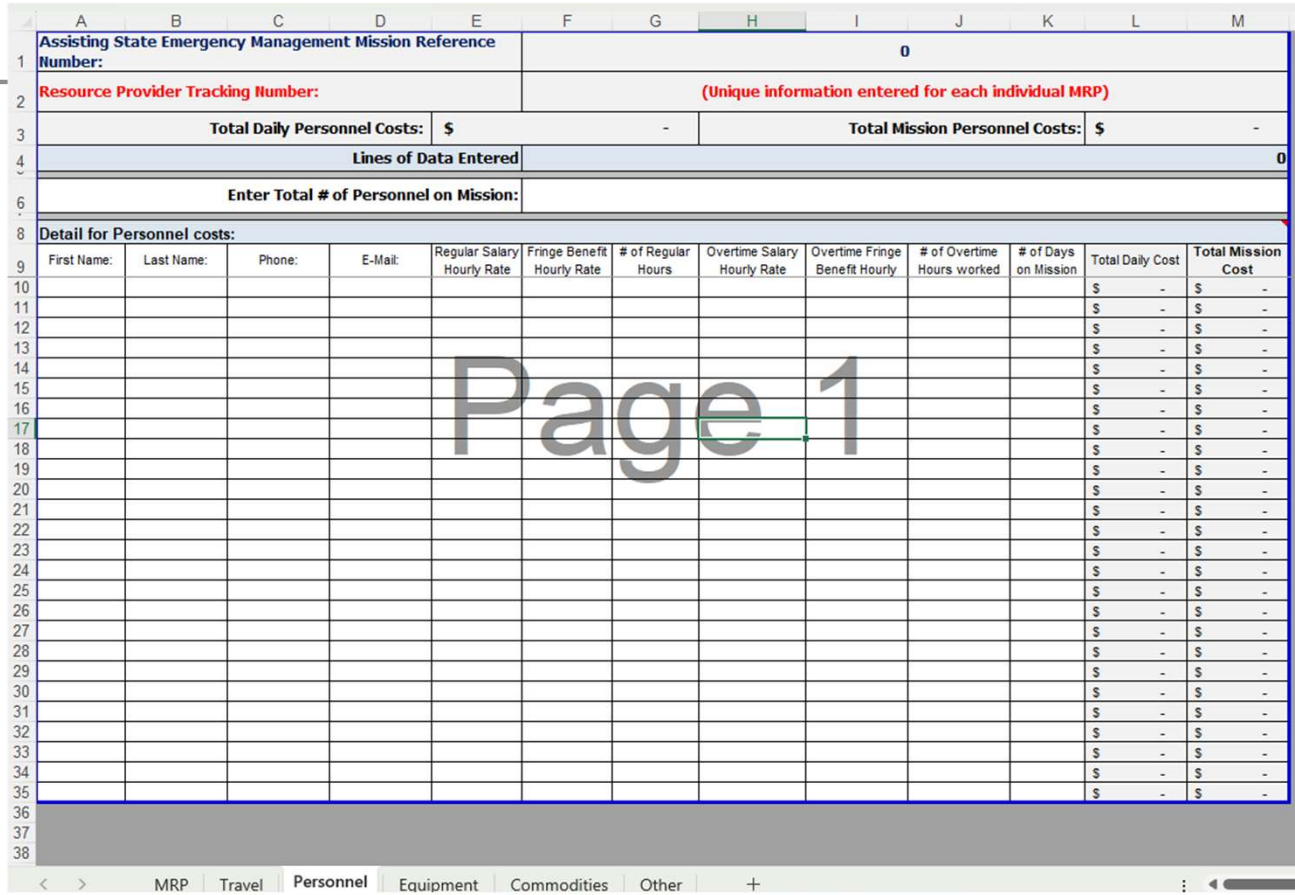
Mission Ready Package Preparation

- Parts of the Mission Ready Package may be prepared ahead of time, e.g., the equipment and commodities worksheets.
- Other parts may be partially completed before a request, e.g. the MRP and Personnel Worksheets
- Other parts are best completed just before deployment, e.g. the travel costs.
- Emergency Management Agency Personnel are good at this.



1	Assisting State Emergency Management Mission Reference Number:						0						
2	Resource Provider Tracking Number:						(Unique information entered for each individual MRP)						
3				Total Daily Personnel Costs:	$	-			Total Mission Personnel Costs:		$	-	
4				Lines of Data Entered									0
6				Enter Total # of Personnel on Mission:									
8	Detail for Personnel costs:												
9	First Name:	Last Name:	Phone:	E-Mail:	Regular Salary Hourly Rate	Fringe Benefit Hourly Rate	# of Regular Hours	Overtime Salary Hourly Rate	Overtime Fringe Benefit Hourly	# of Overtime Hours worked	# of Days on Mission	Total Daily Cost	Total Mission Cost
10												$ -	$ -
11												$ -	$ -
12												$ -	$ -
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We want to know what training you want!

- The Training Section led by Section Chief Tanya Ridgle and the State Support Section have prepared a survey to better understand your training interests.
- This will help us focus out 2026 ROSS Quarterly call training sessions on topics you want as well as topics you need to get signed off in your Position Task Book (PTB).
- The survey will come out via MissionEdge so look for the message.
  - Also get your MissionEdge account completed if not done already!

New Type 1, 2, & 3 ROSS candidates before the Qualification Review Board

- We have had a flood of new Type 4 ROSS
  - This is thanks to Jeramie the FEMA ROSS Program Manager who has been learning the MissionEdge ropes and getting training rosters from CTOS.
  - It is also thanks to all of you who have taken the time to get your training certificates to the FEMA-ROSS@FEMA.DHS.GOV for initial certification.
- Cathy McLellan of Pennsylvania was recommended for certification as Type 2 by the CRCPD HS/ER-4 ROSS Qualification Review Board (QRB).
- We have a new Type 1 ROSS going before the QRB this month – Tanya Ridgle of California!
- Nancy Stanley of New Jersey will also be going up before the QRB this month for her Type 3 ROSS which is the hardest to get!

MissionEdge Updates and Cadre Management Trainings

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Angela Leek, PhD, CHP, FEMA Type 1 ROSS,
angelaleek@quantumradsolutions.com

MissionEdge and Cadre Management Trainings

AHJ and State ROSS Coordinators only

June 30, 2025

1300 – 1430 eastern

All ROSS

July 8, 2025

1500 – 1630 eastern

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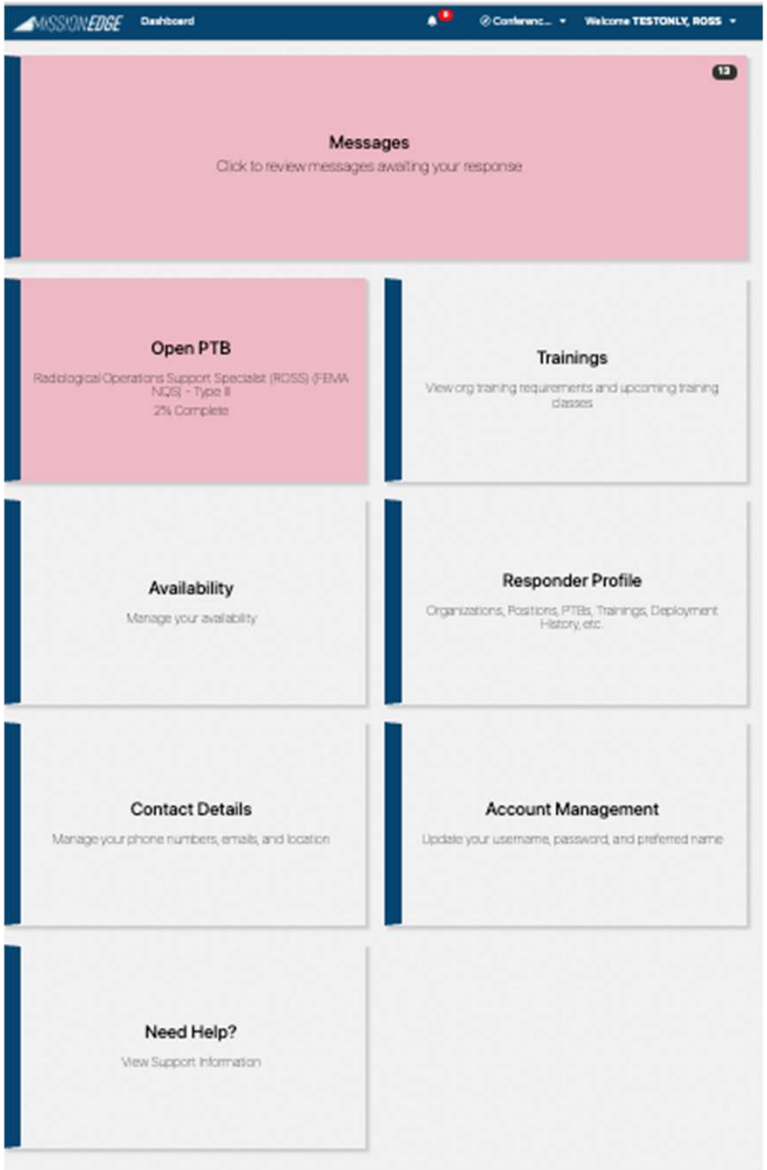
The recordings of these trainings are available if you log into MissionEdge and look under the Need Help Tab.

MissionEdge Account Access

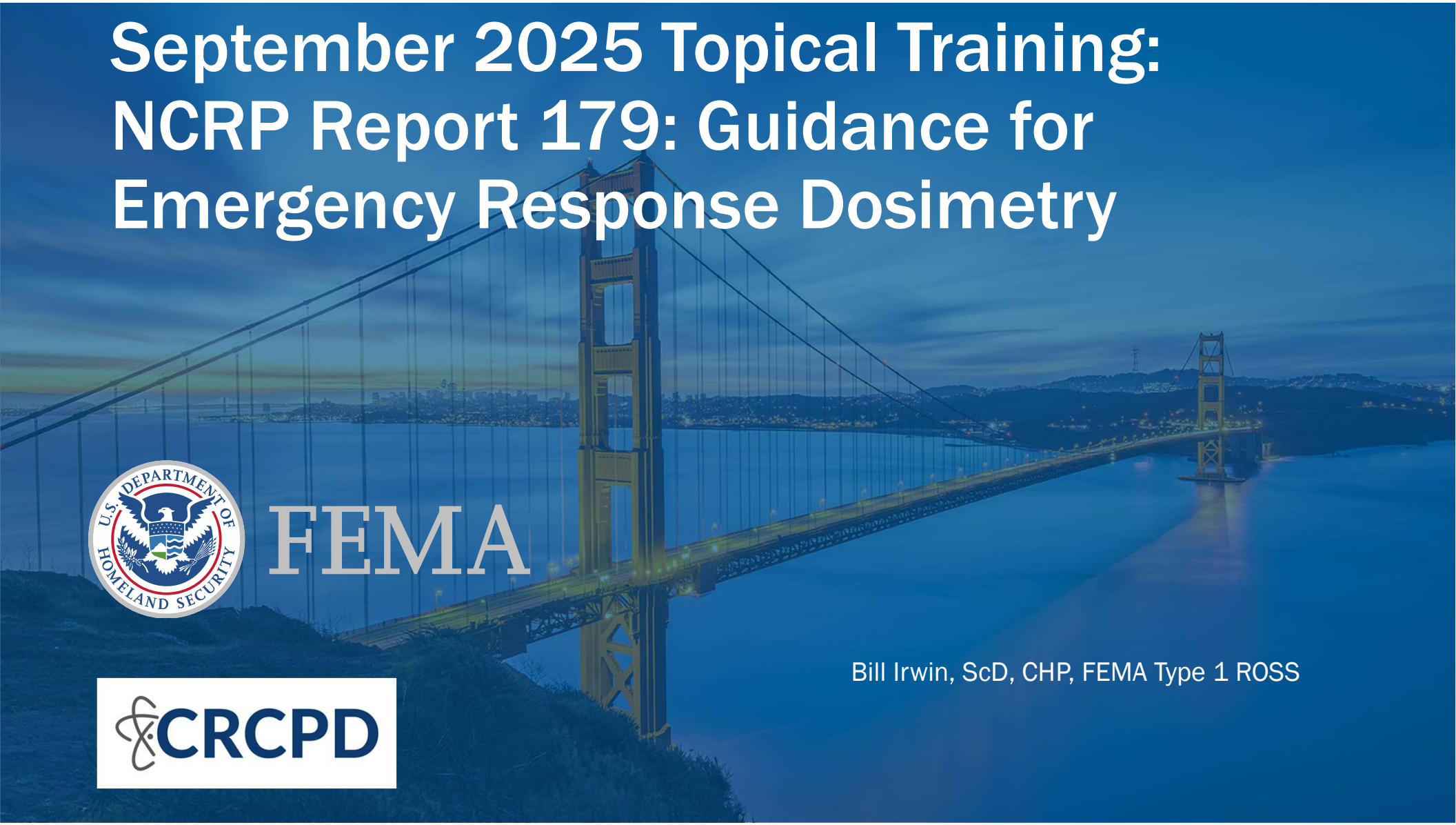
It is critical that you accept your MissionEdge account and monitor it to stay plugged into program activities.

Most ROSS messaging - general messages, deployments, trainings, and surveys - will go through MissionEdge.

You should have received an invitation - if you don't have it or need another link email **FEMA-ROSS@fema.dhs.gov**.



September 2025 Topical Training: NCRP Report 179: Guidance for Emergency Response Dosimetry



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Bill Irwin, ScD, CHP, FEMA Type 1 ROSS

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NCRP Scientific Committee SC 3-1

- First responders
- Scientists from three DOE labs, the CDC, and the DHS National Urban Security Technology Lab (NUSTL)
- An EPA communications specialist
- A radiation oncologist who runs the Radiation Emergency Medical Management website
- The Radiation Safety Officer for the Department of Defense
- Representation from the states, the CRCPD
- The DOE's Consequence Management Director
- A dose reconstruction expert

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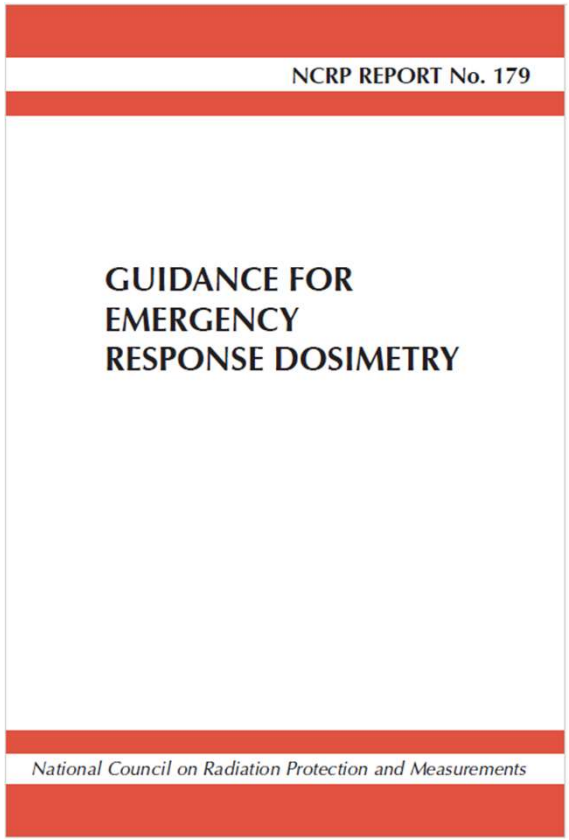
The effort was designed to fill specific guidance needs

- How responder dose may be controlled with minimal dosimetry resources;
- How responder dose may be assigned when some do not have dosimetry; and
- The adequacy of the regulatory framework for responder dose and dosimetry.



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It is written for a broader audience

- Incident commanders
- Emergency response planners
- Senior management of first responder agencies
- Managers of state & local emergency management & public health agencies
- State radiation control programs
- Federal and state regulatory agencies
- Workers involved in a response

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Critical assumptions

- In addition to some traditional radiation workers who will be pressed into response, there will be fire, EMS, law enforcement, transportation, utility workers and others with limited or no radiation emergency response training and experience who become engaged because the circumstances demand it.
- Over time, dosimetry capabilities will improve to become more like traditional rad/nuc emergency response, e.g., for a nuclear power plant.
- In the meantime, dangerous doses are possible, and somehow response managers must manage the doses people are receiving.

Critical assumptions

- Life-saving actions are not to be hampered by dose restrictions.
  - As calculated in a structure fire or during a natural disaster, the incident commander determines whether a responder can save a life without losing his own.
  - The IC must know life-saving takes precedence over radiation concerns other than the most deadly.
  - The IC will need special guidance to help with this determination.
- Doses incurred in this once-in-a-lifetime experience cannot preclude a responder's return to work.

The spectrum of recommendations

- Applying group dosimetry.
- Employing all available instruments, recognizing their limitations.
- Controlling exposure and optimizing doses with the best available evidence, recognizing the measurements may have large uncertainty.
- Maintaining the best accountability for worker time and location, and dose if available.
- Planning beforehand to make dose assessment more effective even in the most catastrophic situation.

Findings and recommendations are presented in boxes for the reader

Text boxes provide critical information that may be found quickly as with this one

> This Report deals with managing issues of radiation dosimetry during the immediate response to a catastrophic radiological or nuclear emergency. This will be a chaotic time when public health and safety agencies could be forced to adapt or modify their routine practices and expectations for conventional standards of dosimetry. While this exception may be necessary in the earliest phase of the response, it is essential that controlling the exposures of first responders is ensured as they carry out their duties to save lives, alleviate human suffering, and protect critical infrastructure.

Dosimetry in chaos, and with scarce resources

- The report can help.
  - A thorough analysis of instrument capabilities.
  - Recommendations based on proven emergency response tactics & emergency management strategies.

> This Report is intended to help serve the national interest and local jurisdictions by providing a scientifically sound and defensible framework for operational dosimetry during an extreme situation in a limited resource environment, including recommendations to bridge the gaps between regulatory requirements and planning for extreme situations.

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An initial challenge: defining the emergency worker we are addressing

- The EPA has a good definition:
  - Workers who may incur increased levels of exposure under emergency conditions and may include those employed in law enforcement, firefighting, radiation protection, civil defense, traffic control, health services, environmental monitoring,, transportation services, and animal care.
- So does the IAEA:
  - A worker who may be exposed in excess of occupational dose limits while performing actions to mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment.
- From Report 179:
  - Those workers who would be called upon to assist with the response to a radiological or nuclear incident, but whose jobs do not routinely expose them to radiation significantly greater than background levels.

Dose limitation

- The tenet that there are no constraints on dose where lives can be saved, does not preclude the use of exposure controls.
  - The primary constraint is all doses must be ALARA.
  - Following that, response organizations should use occupational limits as a foundation for emergency workers for whom they assume a legal custodial relationship.
  - Beyond that, the guidance of the EPA PAGs is appropriate.
- The legal custodial relationship is one many jurisdictions have not dealt with either.

Another legal issue

- This is a very important issue for first responders who must return to their firefighting, emergency medical, law enforcement and radiation protection jobs after the emergency, perhaps with a dose well in excess of the EPA PAGs or NCRP decision dose.

> Emergency workers who receive a dose in excess of 50 mSv in an emergency should not be precluded from returning to work, provided that it is done voluntarily and the individual receives counseling from radiological protection and medical personnel regarding the consequences of their exposure. Furthermore, the dose accrued in an emergency situation should not be added to the dose of record for routine occupational exposure, nor should it preclude employment that would result in additional occupational exposure.

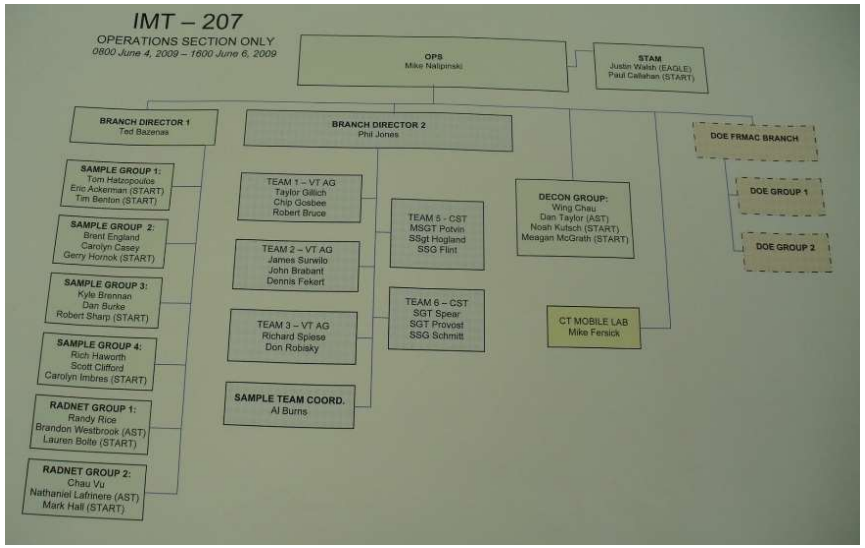
Who is accountable for emergency worker dose management?

- In addition to recognizing their responsibility to manage every responder's radiation dose, the emergency management staff should use the tools of the incident command system use of which is customary for responders.

> An important responsibility for emergency managers engaged in radiological emergency operations is that of accounting for radiation doses of the responders. Key information to support this responsibility requires a strict accounting of the amount of time and location for each emergency worker.

Identify who is accountable and how to manage emergency worker dose

- Know:
  - Who is responding,
  - Where they are,
  - What they are doing,
  - How long they will be there,
  - How to communicate with them, and
  - What the radiological conditions are where they are working.
- Tools like CBRNResponder and MissionEdge can help immensely with this.



An assessment of instrumentation and the ANSI standards for dosimetry

- Instruments assessed:
  - Personal dosimeters,
  - Pocket ion chambers
  - Electronic personal dosimeters,
  - Alarming electronic personal emergency radiation detectors,
  - Non-alarming personal emergency radiation detectors,
  - Personal radiation detectors,
  - Extended range personal radiation detectors, and
  - Radioisotope identification devices.

- All are presented in tables matching them to emergency dosimetry applications and qualifying ANSI standards.

Instruments for certain situations

Emergency response managers can consider these assessments to "calibrate" measurements when responders are using them.

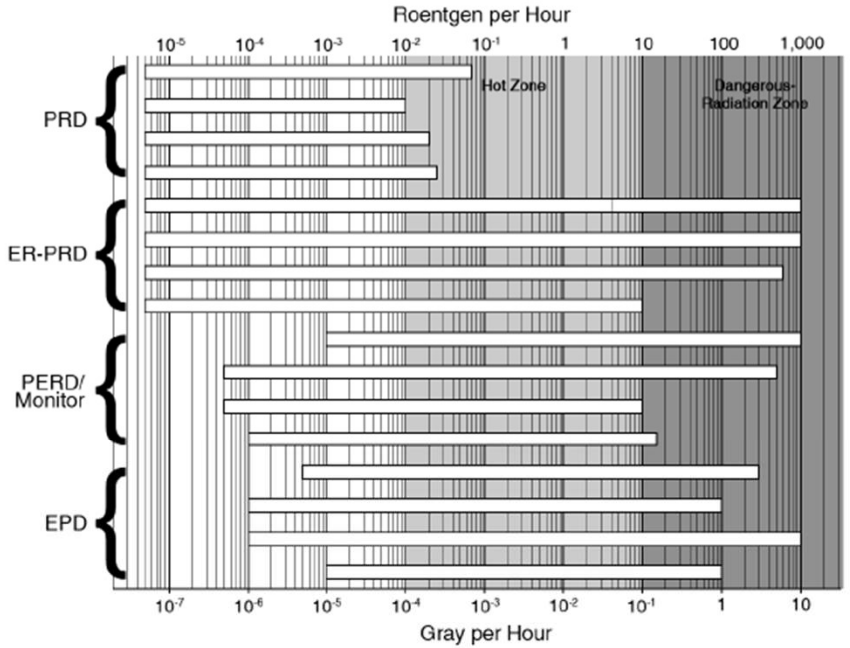
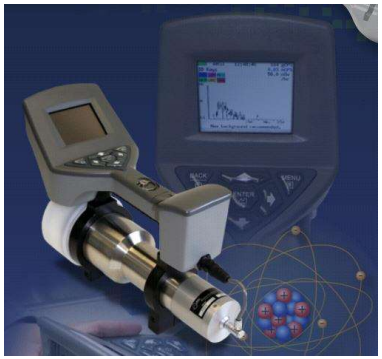


Fig. 4.2. Operational ranges of several commercially available, body worn instruments.



Emergency planners can consider these assessments when acquiring instruments.

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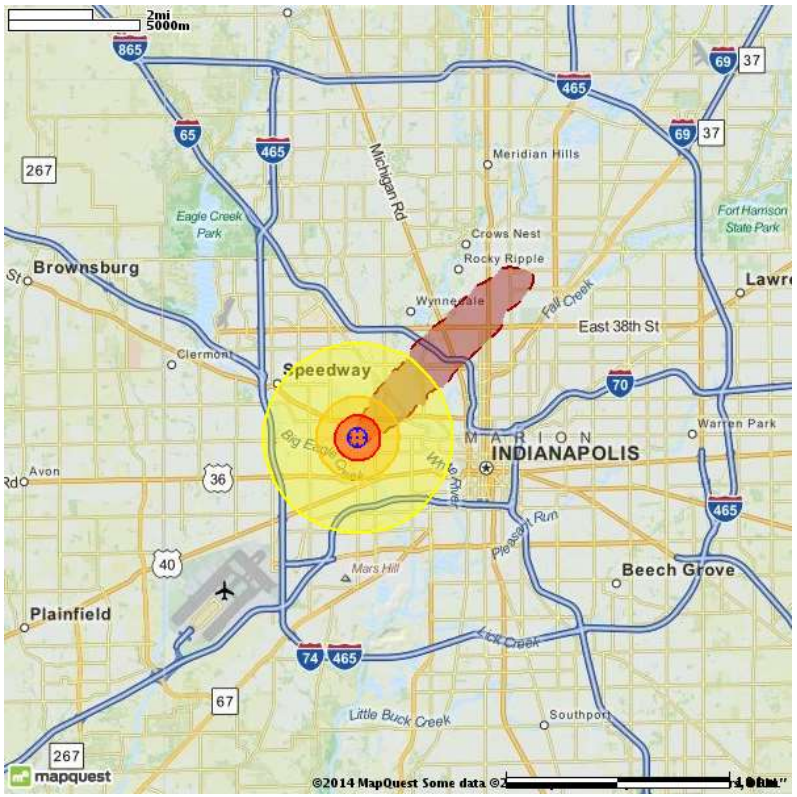
Dose guidance and definition of zones

- These zones are used throughout the current DOE, EPA, DHS, and FEMA guidance for response to a nuclear detonation and for a radiological dispersal device.
  - Cold Zone
    - ≤ 10 mR/h or 0.1 mGy/h
  - Hot Zone
    - > 10 mR/h or 0.1 mGy/h
  - Dangerous Radiation Zone
    - ≥ 10 R/h or 0.1 Gy/h.
  - The severe, moderate and light damage zones for a nuclear detonation.



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Recording & tracking dosimetry data

- Use the incident command system.
  - Emergency responders are familiar with it.
  - Use the chain of command to communicate dose and radiation environment information upward for permanent records, and downward for dose planning in future work.
- Use the Planning Section to collect and disseminate dose related information.
  - The Documentation Unit to collect exposure and environmental survey data.
  - The Situation Unit to provide mapping and other information so leaders can maintain doses ALARA.
- Assign staff to manage records which may be critical for dose reconstruction and other future purposes. Epidemiologists have these skills.

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Four specific records recommended

- Individual dose record
  - Unique to each emergency worker, with some version for the worker to track dose, another for the dose management agency.
- Dosimetry use log
  - Used at entry control points to record dose upon entry and exit from zones while assigning a group or individual dose estimating device.
- Radiation survey of the work environment
  - From hand-drawn to FRMAC-generated, used for planning work and prospectively and retroactively estimating dose.
- Dose record archive
  - For long-term follow-up and dose reconstruction.

Current regulations or emergency worker dose need review and rework

Current regulations for dosimetry by OSHA are based on obsolete recommendations from ICRP and do not facilitate the use of current scientific methods and models to control and assess dose, especially for emergency workers who may not be issued dosimetry in the same manner as an occupational worker as defined by NRC. Even during emergencies, providing workers with dosimetry equipment when available or using other tools to estimate worker doses, is always essential.

NCRP recommends that employers and incident commanders use the best available science for monitoring, assessing and projecting worker dose, and if feasible, follow the relevant provisions of the OSHA Ionizing Radiation Standard and other applicable requirements as closely as possible. In any situation where responders may be exposed to ionizing radiation, take all reasonable actions to minimize dose and provide appropriate protection to responders.

For many, dose will have to be reconstructed

- Three Committee members worked extensively on Fukushima dose reconstruction, two work currently on the million-worker study.
- Dose reconstruction has matured greatly with the weapons era veteran's compensation dose reconstruction effort.

> Preplanning for emergency response dosimetry should reflect the needs for future dose reconstruction.

There are common elements to every dose reconstruction, regardless of its purpose and objective or the amount of information and resources available. In this Report they are identified as:

- source term;
- environmental transport;
- receptor definition;
- exposure scenario; and
- calculation of dose.

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Closing Remarks

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Source: GAO. | www.gao.gov

https://www.gao.gov/products/gao-19-164 accessed 2/23/23.

Thank you for your support of the ROSS Program!

- Our next call will be early December!
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