

**MASSACHUSETTS
STATEWIDE CHEMICAL, BIOLOGICAL AND RADIOLOGICAL THREAT
PERSONAL PROTECTIVE EQUIPMENT STRATEGY FOR
RESPONDERS**



**Submitted by:
THE MASSACHUSETTS DEPARTMENT OF FIRE SERVICES**

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I. EXECUTIVE SUMMARY

The Hazardous Materials Division of the Department of Fire Services has developed a recommended statewide Personal Protective Equipment (PPE) Strategy for chemical, biological and radiological threats for the Commonwealth to encompass all disciplines. This project was submitted as an Investment Justification with the 2006 Homeland Security Grant Strategy to the Executive Office of Public Safety.

The following presents a recommended program to provide training and to measure results such that a tested program of PPE, procedure development and training can be used to verify the strategy developed for the fire service, law enforcement, public health and other disciplines as identified as part of the statewide strategy.

Elements of the strategy include cooperative efforts in training, procedures and equipment selection. Outcome measurement of competency, interoperability and manpower requirements will be used to modify approaches in the statewide strategy.

II. MISSION

The Statewide Personal Protective Equipment Strategy provides guidance, based upon scientific data, federal regulations, national standards and guidelines to provide recommended ensembles of personal protective equipment for emergency responders, receivers of casualties, and others as identified, to protect them from chemical, biological and radiological hazards occurring in or effecting Massachusetts. The resulting strategy is provided to local, state, and private organizations and local branches of federal or national organizations to assist them in evaluating and purchasing appropriate personal protective equipment based upon mission role and to identify, develop and deliver appropriate training in its application and use. This information is provided to foster the most appropriate protection for responders, medical receivers and others and to work toward maximum interoperability within and between disciplines.

III. BACKGROUND

Since 2001, general acceptance or recognition of the potential need to protect responders from exposure to hazardous materials has increased significantly. The advent of true risk for chemical, biological and radiological (CBR)¹ incidents has driven a rapid effort among all levels of response, including healthcare, to protect employees from potential exposure and contamination. Absent a strategy, this effort has been largely vendor driven and not coordinated across large areas to achieve interoperability.

Multiple concurrent initiatives, such as the National Incident Management (NIMS) and Homeland Security Presidential Decision Directive #8 (HSPD-8) seek to drive planning and preparation toward

¹ The reader will see both CBR and CBRNE terms used in this document. This document addresses ONLY chemical, biological and radiological threats or CBR. Referenced materials from other sources generally use the full acronym of CBRNE which includes nuclear and explosive. Where the CBRNE acronym is used, it is to maintain the integrity of cited material only.

wide area cooperation and interoperability. While early interoperability efforts focused upon communications, realization that interoperability extends to all aspects of preparedness and response are changing that culture.

In mid-2005, members of the Northeast Homeland Security Council asked for a meeting of Department of Fire Services staff to discuss the outcomes of a consultant report on PPE and directions to meet the gaps revealed in that report. That initial meeting lead to a series of meetings and agreement to work toward a universal regional PPE strategy for responders. The basis of this strategy was found in the 2004 Annual Report/2005 Standardized Equipment List of the Interagency Board (IAB). Efforts to develop and implement function and risk based strategies are well underway in the Northeast Region.

Within all disciplines, wide arrays of efforts are on going to protect workers and the direction of these efforts is not catalogued. Thus, the statewide PPE strategy will seek to align the direction of the various efforts such that a high degree of interoperability can be achieved.

IV. IMPACT UPON OPERATIONS

Through the adaptation and application of role /mission identification, common PPE strategy and common mission based competency training, it will be possible to establish more meaningful resource typing within the Commonwealth. Valid resource typing will allow incident commanders to request resources from throughout the state with confidence in their common ability to carry out the intended mission with proper training and equipment. Thus, incident commanders will not need to poll individual agencies regarding their capabilities, rather simply state the mission and resource type required.

As a matter of responder safety, proper assignment and understanding of the limits of protection should prevent the over-assignment of responders into environments for which they are not properly trained or equipped. Responders can also have added confidence that their capabilities and levels of protection have been considered and are appropriately matched.

V. THE HAZARD ENVIRONMENT AXIS

A key part any strategy is the evaluation of hazards. No single piece of equipment or ensemble is adequate or appropriate for all hazards. Agent properties and toxicities vary by their route of exposure with combinations of respiratory route and dermal route entry and degree of hazard. It is important to understand the varying hazards posed and consider these hazards in both PPE selection and in mission assignment.

This axis is based first on general weapon/hazard type, followed by an assessment of the physical state. For example, chemical weapons can exist as particulates, liquids or airborne vapors, gases or aerosols. Based upon credible intelligence and threat assessment information, a community might choose to select PPE designed to protect the responder from an event utilizing common toxic industrial materials in concentrations that are detrimental to the respiratory tract. In that case, the selection of “Chemical Weapon, Vapor/Gas/Aerosol in High Respiratory/Low Dermal concentrations” might be selected. In planning for potential RDD (radiological dispersion device)

events, the selection of “Radiological with Penetrating Gamma” would be appropriate. Whatever selection is made will direct the user to the most up-to-date information concerning what, if any, protective ensembles are currently recommended, as well as usage limitations. The table below shows the hazard environment definitions adopted by the PPE Subgroup of the IAB for use in the Standardized Equipment List (SEL):

Category	Environment	Definition
Chemical	Vapor/Gas/Aerosol (High Respiratory, High Dermal) [VI]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as a gas, a vapor that evaporates from a liquid, or a finely aerosolized low vapor pressure liquid. High Respiratory refers to the airborne concentration present and suggests that the concentration is above respiratory IDLH levels. High Dermal indicates a significant dermal contact or absorption risk for acute/chronic skin toxicity or systemic health effects via skin contact (e.g. carcinogens).
	Vapor/Gas/Aerosol (High Respiratory, Low Dermal) [VR]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as a gas, a vapor that evaporates from a liquid, or a finely aerosolized low vapor pressure liquid. High Respiratory refers to the airborne concentration present and suggests that the concentration is above respiratory IDLH levels. Low Dermal indicates that vapors or gases are not in a high enough concentration to create a condition that is immediately dangerous to the wearer or conducive to systemic or chronic health effects via skin contact (e.g. carcinogens).
	Vapor/Gas/Aerosol (Low Respiratory, Low Dermal) [VL]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as a gas, a vapor that evaporates from a liquid, or a finely aerosolized low vapor pressure liquid. Low Respiratory refers to situations where the airborne concentration is anticipated to be below IDLH levels. Low Dermal indicates that vapors or gases are not in a high enough concentration to create a condition that is immediately dangerous to the wearer or conducive to systemic or chronic health effects via skin contact (e.g. carcinogens).
	Liquids (High) [LH]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as a liquid where the potential exists for contact with that liquid. High indicates conditions where extended contact in the form of splashes is expected.
	Liquids (Low) [LL]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as a liquid where the potential exists for contact with that liquid. Low indicates conditions where incidental contact could be expected from contaminated surfaces.
	Particulates (High) [PH]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as solid particles (particulate) or dust. High indicates that the concentration is above respiratory IDLH levels, or that the CBRNE agent is carcinogenic.
	Particulates (Low) [PL]	A chemical warfare agent or toxic industrial chemical found at the response scene that is present as solid particles (particulate) or dust. Low indicates that the concentration is below respiratory IDLH levels, and that the CBRNE agent is noncarcinogenic.
Biological	Airborne	Microorganisms that can be spread as aerosols or particulates, and

	[BA]	are considered airborne threats for respiration and in some cases also through dermal contact.
	Liquid-borne [BL]	Microorganisms that can be spread by contact with blood, body fluids, and other contaminated liquids.
Radiological	Particulate/Liquid (Alpha and Beta) [AB]	Alpha or beta ionizing radiation that is spread by particles suspended in air or liquids. The primary hazard from these materials is through inhalation of particulates; skin contact should also be avoided.
	Particulate/Liquid Penetrating Gamma [G]	The threat from gamma ionizing radiation consists of both exposure to and contamination by gamma emitting radioactive isotopes and exposure to machines generating X-ray. Other than time, distance, and shielding, PPE is limited to minimizing direct contact with or inhalation of contaminated material.

VI. The Mission Role Axis

Within each responding discipline, mission roles can be clearly defined. Each role, for each discipline carries a different expectation of performance and risk. The premise of the strategic plan is that protection levels should be based upon the expected role of the individual and the associated risk. Responders should be equipped and trained to protect against the risk that they are reasonably expected to encounter and to the degree that their role is offensive or defensive, or escape versus entry.

The 2008 “Standardized Equipment List” developed by the Inter-Agency Board for Equipment Standardization and Inter-Operability (IAB) presents a matrix termed the “Risk/Level of Exposure to the Hazard (The Mission Role Axis)” which may serve as guidance for this purpose. The IAB describes the matrix as follows:

“For a more detailed risk assessment of responders at CBRNE events, it is necessary to describe each responder’s particular mission during the incident. By describing the mission, one can estimate numerous variables that place the individual at either an increased or decreased risk of actual exposure to the hazard. These variables include factors such as proximity to the potential release, potential exposure to immediately dangerous to life and health² (IDLH) environments, timing of arrival with regard to weapon dispersion, and probability of contact with potentially contaminated victims or surfaces. The mission roles listed in the matrix enable the community to consider a responder’s job function during the CBRNE incident in comparison to the hazard. This results in a better matching of protective postures towards actual risk.

The fact that a mission role is listed in a particular duty area is not intended to imply that the role is not applicable to other duty areas. For example, rescue teams may be located in law enforcement, fire department, or emergency medical duty areas depending upon the performance expectations of the community and their Comprehensive Emergency Response Plan. In the interest of keeping the matrix to a manageable size, mission roles are not repeated in every possible duty area.

² IDLH is a designation of the National Institute for Occupational Safety and Health. For more information on IDLH, see the “NIOSH Pocket Guide to Chemical Hazards,” September 2005 edition, Document DHH (NIOSH) Publication No. 2005-19, pages ix-x.

Additionally, the reader must bear in mind that the mission roles presented in the matrix are based upon their assigned mission after the event occurs. Therefore, those assigned to First Responder roles such as “Patrol Officer”, “Firefighter” and “Medical First Receiver” will often be reclassified to another listed mission role once they become involved in the event (e.g. perimeter control, decontamination team, or contaminated patient care).³, Individuals who are expected to evolve in their mission role cannot do so in this strategy until the requisite protection is available. This may require, in local planning, that responder carry more PPE selection with them if they are expected to evolve to a more offensive role prior to or without additional response.

Thus, the Mission role definitions provided can be used to develop a spectrum of duties and risk for each duty area and, locally, each unit. The duties and associated risks determine reasonable expectations and needs for initial (on-hand) protection and for the risk and necessary transition to a CBRNE mission duty area. Guidance can then be formulated for training and purchase decisions to what is necessary for each unit locally and those resources that can be provided regionally and deployed to meet the transition of roles into CBRNE functions. [Local and regional response planning organization should determine the most likely exposure hazards scenarios and determine mission roles for its personnel prior to PPE selection.](#) The result should be the ability to maximize grant funding to provide greater quantities of protection for the primary mission, pre-release, and to leverage regionalization to meet higher protection levels for CBRNE missions.

The following table will serve several purposes through the Massachusetts Statewide PPE Strategy:

1. Define a common division of duties for responders
2. Develop role based risk analysis and expected capabilities
3. Used as a planning tool for local government and responder organizations to identify both initial and transitioned CBRNE roles duties for responders
4. Used by local government and responder agencies to determine intrinsic versus regional capabilities.

³ 2008 Standardized Equipment List, InterAgency Board for Equipment Standardization and InterOperability (IAB), PP. 103, The Mission Role Axis

The table below shows the mission role definitions adopted by the PP&OE Subgroup for use in the SEL:

Duty Areas	Mission Role	Definition
Law Enforcement	First Responder/ Patrol Officer	Initial response into possible CBRNE incident in law enforcement capacity. Responder would have risk of exposure during the first response and initial phase of the event. Any requirement to work within the hazardous environment beyond the initial recognition phase would generally result in the individual being reclassified into one of the other mission areas identified in this matrix.
	Force Protection	Force protection at a CBRNE incident scene or at critical supporting infrastructure locations (e.g. medical, communications, logistical support, staging or command and control locations) and access control points for the purpose of ensuring the safety of operating personnel and assets.
	Perimeter Control and Field Force	Scene control, credentialing, perimeter security, and crowd control.
	Evidence Technician	Sample and evidence collection in cold, warm, and hot zones. These technicians may be involved in a variety of investigative processes including criminal investigation and environmental sampling.
	Tactical (SWAT)	Entry into any zone for immediate tactical action, hostage rescue, or assault.
Fire Department	Fire Responder/ Firefighter	Initial response in fire service capacity. Responders would have risk of exposure during the initial stages of the event. Any requirement to work within the hazardous environment beyond the first response and initial recognition phase would generally result in the individual being reclassified into one of the other mission areas identified in this matrix.
	Rescue Team	Response to an incident for the purpose of rescuing non-ambulatory
	Rapid Access Mass Decontamination* ⁴	Stand-off decontamination of victims
	Mass Decontamination Unit* ⁵	Decontamination of response personnel and victims utilizing Mass Decon Unit.
Emergency Medical Services	First Responder/ Medical First Receiver	Initial response in medical services capacity; responding to a report of an incident or being the first medical person to receive or recognize casualties from a CBRNE event. Responders would have risk of exposure during the initial phases of the event. Any requirement to function in another capacity beyond the first response and initial recognition phase of the event would generally result in the individual being reclassified into one of the other mission areas identified in this matrix.

⁴ Note: * Denote Massachusetts Specific designation, not derived from the IAB.

⁵ ibid

Duty Areas	Mission Role	Definition
	Contaminated Patient Care	The medical care provider or allied medical professional (e.g. medical examiner) at any location or level of response who is likely to provide care or service to patients or victims who are likely to pose a significant risk of secondary contamination or exposure. These medical personnel may also be involved in the decontamination process.
	Non-Contaminated Patient Care	The medical care provider or allied medical professional (e.g. medical examiner) at any location or level of response who is likely to provide care or service to patients or victims who do not pose a significant risk of secondary contamination or exposure. The determination of lack of significant risk may be based upon a wide variety of factors including, but not limited to, the proximal location of the patient/victim at the time of CBRNE release, the physical/chemical properties of the CBRNE, the use of detection equipment or the extent of decontamination already taken.
Follow-On Responders	Administrative/ Logistical Support Personnel	Those individuals that would follow-on in the response to assist with administration and logistical support of the event. These individuals would not normally be subjected to potential exposure provided appropriate force protection and perimeter security measures are in place.
	Technical and Skilled Specialty Personnel - Isolation Area	Those trade personnel called upon to provide a focused specialty function. These functions would likely be carried out in the isolation area of the event and therefore, potential exposures to materials are likely.
	Technical and Skilled Specialty Personnel - Non-Isolation Area	Those trade personnel called upon to provide a focused specialty function. These individuals would not normally be subjected to potential exposure provided appropriate force protection and perimeter security measures are in place.
Special	Hazardous Device Operations	Response to incidents involving a hazardous explosive and/or dispersal device within the isolation area, for the purpose of identification, rendering safe, or removal of such device(s). For operations outside the isolation area, PPE requirements are determined by specific mission role.
	HAZMAT Operations	Response to incidents involving CBRNE or hazardous materials within the isolation area for the purpose of detection, sampling, identification, control, and/or remediation. For operations outside the isolation area, PPE requirements are determined by specific mission role.
	Incident Command Team/Unified Command	Response to incidents for purposes of assuming incident command in the field, including establishment and operation of a field incident command center.
	Urban Search and Rescue (US&R)	Response to events in the isolation area involving collapsed structures for the purpose of locating and rescuing trapped victims, or structural stabilization.
	Environmental/ Occupational Health Operations	Response to incidents involving CBRNE or hazardous materials in order to gather data/samples for the purpose of assessing human health risks to responders or the community.
	Epidemiology	Conducting interviews and/or investigations for the purpose of gathering epidemiological information.
	Mortuary Operations	DMORT (Disaster Mortuary Operational Response Team) or coroner/medical examiner, law enforcement, morticians. PPE requirements are determined by specific mission role, e.g. sampling, preservation, etc.

The 2008 SEL suggests a follow-on planning process of identification of specific risk types. These risks types are based upon known product types to be protected from. With few exceptions, the broad nature of Homeland Security concerns and an “all hazards” approach renders this process of little value in developing the PPE strategy. Essentially, this process must assume all types of CBRNE events. The result of the risk type selection of the SEL would allow responder agencies to focus their needs upon the specific PPE requirements of a specific agent. Unfortunately, this will not aid this strategy.

The “all hazards” approach may be necessary in the very early stages of an incident before the hazards have been identified, but should be modified as soon as the incident has been characterized. Relying on the “highest common denominator” when selecting PPE may result in overprotection or under-protecting responders over the course of the operation.

The next step in the process will be to further classify protection levels by their practicality of use for the mission roles defined in this section. This will allow a determination, by mission role and PPE, of offensive versus defensive posture.

VII. PPE Standards and Hazard Environments

In addition to the Hazard/Mission matrix, the SEL updates the table relating hazards to existing standards. National or federal standards are critical to a strategy of protection. Adherence to established standards provides a degree of confidence to the wearer and protects the employer by demonstrating by independent consensus and/or scientific testing that the equipment, training, or practices has been independently certified to be effective against the hazards for which the standard is written.

Unfortunately, standards for PPE against weapons of mass destruction, such as CBR agents lag significantly behind manufacturer development. It is probable that equipment sold or intended for protection may either fail to achieve certification or may require modification to obtain certification or meet specific standards. **Diligent attention to equipment approvals, modifications and caveats to approval are the responsibility of the buyer, at the time of purchase and throughout the useful life of the equipment. Current relevant standards, including those for personal protective equipment can be accessed, in their most current version at www.firstresponder.gov**

The figure on the following page identifies recognized standards that apply to PPE used for protection from specific types of hazards encountered by responders during a CBRNE incident. Start with the left side of this chart to select the types of hazards that may be potentially encountered (the definitions are the same as those used in the Hazard axis of the Hazard/Mission matrix). Then look across the top of the chart to find the current nationally recognized standard(s) that address the selected hazards.

EXPOSURE / HAZARD	Respiratory Protection					Personal Protective Clothing											
	NIOSH CBRN-SCBA	NIOSH CBRN-APR [5]	NIOSH CBRN PAPR [5]	NIOSH CBRN Escape (SC) [8]	NIOSH CBRN Escape (AP) [8]	NFPA 1991	NFPA 1991 with Flash Fire Option	NFPA 1994 Class 2	NFPA 1994 Class 3	NFPA 1994 Class 4	NFPA 1992 (Liquid Splash)	NFPA 1951 Utility	NFPA 1951 Rescue & Recovery	NFPA 1951 CBRN	NFPA 1999	NFPA 1971 Structural CBRN	NFPA 1971 Structural
UNKNOWN ENVIRONMENT	A					A	A	A								A	
CHEMICAL																	
Vapor/Gas/Aerosol (High Respiratory[1], High Dermal[3])	A					A	A	A								A	
Vapor/Gas/Aerosol (High Respiratory, Low Dermal[4])	A					A	A	A								A	
Vapor/Gas/Aerosol (Low Respiratory[2], Low Dermal)	A	A	A	E	E	A	A	A	A					A		A	
Liquids (High)[6]	A					A	A	A			L					A	
Liquids (Low)[6]	A	A	A	E	E	A	A	A	A		L			A		A	
Particulates (High)	A					A	A	A	A	A				A		A	
Particulates (Low)	A	A	A	E	E	A	A	A	A	A				A		A	
BIOLOGICAL																	
Airborne	A	A	A	E	E	A	A	A	A	A				A		A	
Liquid-borne	A	A	A	E	E	A	A	A	A	A	A		A	A	A	A	A
RADIOLOGICAL/NUCLEAR[7]																	
Particulate/Liquid (Alpha and Beta)	A	A	A	E	E	A	A	A	A	A	A			A		A	
Particulate/Liquid Penetrating Gamma / X-Ray [9]	A	A	A	E	E												

A	Provides protection from the indicated CBRN exposure.
L	Does not provide specific protection from CBRN exposures, but does provide limited protection from collateral exposures such as TICs/TIMs once the CBRNE threat has been mitigated.
E	Provides protection from the indicated CBRNE exposure for escape purposes only. Not intended for operations in the indicated hazard environment.

Key to Matrix Values:

- A Provides appropriate protection from the indicated CBRNE exposure.
 - E Provides protection from the indicated CBRNE exposure for escape purposes only. Not intended for operations in the indicated hazard environment.
 - L Does not provide specific protection from CBRN exposures, but does provide limited protection from collateral exposures such as Toxic Industrial Chemicals/Toxic Industrial Materials (TICs/TIMs) once the CBRNE threat has been mitigated.
-
- 1 “High Respiratory” indicates that airborne concentrations are anticipated to be at or above IDLH or respirator maximum use concentration levels.
 - 2 “Low Respiratory” indicates that airborne concentration is at or above published Short Term Exposure Limits (STEL) but less than IDLH or respirator maximum use concentration.
 - 3 “High Dermal” indicates a significant dermal contact or absorption risk for acute/chronic skin toxicity, sensitization, corrosiveness, or systemic health effects via skin contact (e.g. carcinogens).
 - 4 “Low Dermal” suggests that vapors or gases are not in a high enough concentration to create a condition that is immediately dangerous to the wearer or conducive to systemic or acute/chronic health effects via skin contact (e.g. carcinogens).
 - 5 Cartridges and canisters utilized for Air Purifying Respirators (APRs) and Powered Air Purifying Respirators (PAPRs) may have significant life limitations in airborne particulate hazards of sufficient quantity to cause filter loading.
 - 6 With regard to liquid chemical hazards. Although expressed in this matrix in general terms, selection of respiratory levels of protection would be dependent upon the volatility of the material and results of quantitative analysis of airborne concentrations.
 - 7 The specific hazard/exposure indicated is radiological. Nuclear hazard environments will also include thermal and explosive components if detonation occurs.
 - 8 CBRN Escape Respirators are grouped into two categories for this table: Air Purifying (AP) which includes respirators with and without the carbon monoxide (CO) option; and Self Contained (SC), which has its own air supply. Protections are limited to duration required for escape activity.
 - 9 Gamma emitting radioactive materials that are airborne can be effectively removed from the inhaled air through the use of respiratory protection. Elimination of the inhalation of radioactive materials will minimize internal contamination, however it will not reduce the external exposure to penetrating radiation.

VIII. The Ensemble Selection Process

In order to select the appropriate PPE ensemble, all sectors of the emergency response community must first complete a thorough threat assessment that at least identifies the most probable scenarios. Such scenarios should, at a minimum, address two major areas:

- What are the “Hazards” likely to be encountered, e.g. chemical (vapors, liquids, particulates), biological, radiological, explosive, etc.?
- What is the likely “Mission” (job function) of each responder during the event, and what are the type, level, and likelihood of exposure to potential hazards?

Although the tendency is to try to prepare for every eventuality, that approach is generally neither financially feasible nor appropriate. Thus the community should determine the most credible and likely threat “scenarios” as a basis for planning. This assessment can only occur through a coordinated communication and planning effort involving emergency response organizations, emergency planning officials, and the intelligence community.

This coordinated planning effort should produce an “inventory” of the most likely scenarios, as well as anticipated responder roles. The results can then be applied using the Hazard/Mission matrix described below. Completing this organized process of assessing the threat, planning the response, and identifying equipment gaps as a prerequisite to equipment selection is strongly encouraged.

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IX. SEL Selection Factors

Like many sections in the 2008 Standardized Equipment List, the online version⁶ of the Personal Protective Equipment Section uses a pair of selection factors to assist users in quickly identifying appropriate equipment items. For this section, the Sub-Group chose to use Hazard Environment and Mission Role as the two factors. Every online item is “tagged” for each appropriate combination of factors. Thus users of the online version can choose any combination of Hazard Environment and Mission Role, and the system will provide a list of all items tagged for that combination.

The best way to visualize the interaction of the two selection factors (Hazard and Mission Role) for PPE is to view them as a matrix, as shown on the following page. The hazard or threat, including the likely physical state in which it would manifest itself, forms the “Hazard Environment” (horizontal) axis of the matrix. The vertical axis represents the likelihood of exposure based upon generalized job functions - the “Mission Role” axis of the matrix. Matching a mission role to one or more hazard environments gives a recommended set of equipment items. The values used in each of these two axis’ are described in detail below. NOTE: Currently, this table only addresses CBRNE hazards. As the SEL continues its transition to an all-hazards scope, the table will be expanded to reflect both additional missions and hazards.

X. RISK BASED PPE REQUIREMENTS

⁶ The online version is available on the Responder Knowledge Base, www.rkb.mipt.org.

To be effective, a PPE strategy must be realistic. Any strategy must take into account factors such as the ability of the responder to carry, maintain, and don the equipment such that it provides protection and does not place the responder in a position of undue hazard from impracticality or over-expectation. A balance must be reached between role mission expectation and PPE expectation such that each role is adequately protected for their mission. If adequate and realistic protection cannot reasonably be achieved, the expectation of the mission must be reduced. In many instances, this will change the role mission expectation from an offensive to purely defensive expectation.

By way of example, it would be unrealistic to expect a responder, serving in a role of immediate discovery of a CBRNE event, to serve in an offensive manner when equipped with only an air-purifying respirator. The limited protection of this equipment does not meet the standards for unknown risks. It would be similarly unreasonable to plan for the responder to remain in the effected area and don chemical protective clothing as they would be exposed and potentially contaminated inside of the protective clothing while donning it. It stands to reason that most responders in their daily mission will initially have a defensive or escape function and PPE should support that function.

It should also be noted that the listed responders in these matrices should not be considered as exclusive. Just as this process can be applied to new threats, it can also be applied to other responders as they are identified either generally or in association with a specific new threat. One immediate example is the need to address veterinary practitioners with regard to suspected incidents of avian flu in either domestic or wild fowl in Massachusetts. Though already in process, any such effort must be folded into the statewide strategy for such a strategy to be effective.

XI. TRAINING AND PERFORMANCE STANDARDS

Equipment strategies alone cannot provide adequate responder protection or meet the needs of an effective response to a CBRNE event. Responders must be trained in the strategies and tactics of response as well as how and when to use PPE. Most of the existing standards for response to CBRNE events are derived from standards and regulations developed for response to industrial and transportation emergencies involving hazardous materials, or other related, but non-CBRNE, standards.

As a consequence of the lack of specific standards, efforts have been made to best meet the anticipated needs of CBRNE response through application, interpretation or exception to other standards and regulations. Efforts are on going within federal agencies and standards organizations to correct deficiencies or ambiguities and better serve current needs.

The Statewide PPE Strategy may seek to utilize emerging standards and regulations, though currently in draft, in anticipation of passage without substantial change. The performance and training standards contained in these drafts can be used as constructs around which a training curriculum may be written. Thus, the consideration taken in developing these draft documents can be utilized in developing future training. With the majority of work completed based upon the draft standards, modification can be made accordingly. This process is anticipated as taking less time than awaiting the final versions.

The following primary standards or regulations will likely impact the planning process; National Fire Protection Association (NFPA): Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, Standard 472 (2008 version), U.S. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (under revision), 29 CFR 1910.132, 29 CFR 1910.134 and National Institute Of Safety and Health (NIOSH) product certifications for CBRNE (on going). While OSHA regulations are likely to identify applicability and responsibilities in worker protection, NFPA standard 472 will most specifically identify training to address roles and missions. NIOSH equipment certification will, and potentially with substantial economic impact, determine if purchased equipment or planned purchases can be used as protection for CBRNE response.

NFPA 472, as originally issued, has driven the training for emergency responder to hazardous materials incident through its competencies for five levels of responder; First Responder Awareness, First Responder Operational, Hazmat Technician, Hazmat Specialist and Hazmat Incident Commander. As the emergency response community has identified roles that fall in between those defensive competencies of the operations level responder and those of the technician, the NFPA has sought to provide reasonable solutions to the need for flexibility, while not abandoning the concept that offensive actions regarding hazardous materials is a highly specialized skill.

In its current draft version, the NFPA has identified nine subcategories of hazardous materials first responder. In combination with core operations level responder competencies, these subcategories provide a narrowly focused specialization for responders who will serve specific and limited functions under specific and limited circumstances. The proposed operations subcategories are as follows:

Subcategory	Description⁷
Operations Level Responders Assigned to Perform Air Monitoring and Sampling	Persons assigned to perform air monitoring and sampling during hazardous materials/WMD incidents in accordance with their emergency response plan and/or standard operating procedures.
Operations Level Responders Assigned to Perform Decontamination During Hazardous Materials/WMD Incidents.	Persons who might be assigned to perform mass or technical decontamination operations.
Operations Level Responders Assigned to Perform Product Control	Persons who are expected to, and are trained to, perform control options during hazardous materials/WMD incidents in accordance with their emergency response plan and/or standard operating procedures, and who operate under the guidance of a hazardous materials technician, written standard operating procedures, or an allied professional.
Operations Level Responders Assigned to Perform Victim Rescue/Recovery During Hazardous Materials/WMD Incidents.	Persons who might be tasked with the rescue and/or recovery of exposed and contaminated victims.
Operations Level Responders Assigned to Respond to Illicit Laboratory Incidents.	Persons who, during hazardous materials/WMD incidents involving potential violations of criminal statutes specific to the illegal manufacture of methamphetamines, other drugs, or weapons of mass destruction, support the response effort by securing the scene, identifying the laboratory/process, and

⁷ Source: Report on Proposals 2006, NFPA – Copyright, NFPA

	by preserving evidence.
Operations Level Responders Assigned to Use Personal Protective Equipment During Hazardous Materials/WMD Incidents.	Persons who might be assigned to duties that require the use of personal protective equipment to (in) order to perform mission-specific tasks.
Operations Level Responders Assigned WMD Biological Responsibilities	Persons who, in hazardous materials/WMD incidents involving biological materials, provide support to the hazardous materials technician and other personnel, provide strategic and tactical recommendations to the on-scene commander, serve in a technical specialist capacity to provide technical oversight for operations, and act as a liaison between hazardous materials technicians, response personnel, and other outside resources.
Operations Level Responders Assigned WMD Chemical Responsibilities	Persons who, in a hazardous materials/WMD incidents involving chemical materials, provide support to the hazardous materials technician and other personnel, provide strategic and tactical recommendations to the on-scene incident commander, serve in a technical specialist capacity to provide technical oversight for operations, and act as a liaison between hazardous materials technicians, response personnel and outside resources.
Operations Level Responders Assigned WMD Radiological Responsibilities	Persons who, in a hazardous materials/WMD incidents involving radioactive materials, provide support to the hazardous materials technician and other personnel, provide strategic and tactical recommendations to the on-scene incident commander, serve in a technical specialist capacity to provide technical oversight for operations, and act as a liaison between hazardous materials technicians, response personnel and outside resources.

Assuming the adoption of these proposed changes, it becomes possible to match the Operations Level training and competencies to the mission roles described in Section II of this document. Subcategories suggested by the proposed standard may be grouped to provide complete role specific training programs that will reduce repetitive training requirements that might result if training for each subcategory is viewed in isolation and provide individually.

For example; a tactical police officer may have a training curriculum that includes:

- Hazardous Materials Operation Core Competencies
- Operations Level Responders Assigned to Perform Decontamination During Hazardous Materials/WMD Incidents.
- Operations Level Responders Assigned to Perform Victim Rescue/Recovery During Hazardous Materials/WMD Incidents.
- Operations Level Responders Assigned to Respond to Illicit Laboratory Incidents.
- Operations Level Responders Assigned to Use Personal Protective Equipment During Hazardous Materials/WMD Incidents.

Because each of these subcategories may contain common competencies, the grouping of them into a single “role/mission” based program will reduce the overall training requirement when compared to offering each as a separate program or certification.

This process may further aid in competency maintenance as the identification of competencies to be reviewed or evaluated in recurrent training, as would be made possible by this approach, will allow the identification of appropriate cross discipline training. Effectively, this would allow police officers to maintain certain competencies by attending fire or EMS training and vice versa.

XII. MISSION ROLE RECOMMENDATIONS AND RATIONALE

The following Mission role recommendations describe the definition of mission role as described in the Interagency Board matrix. From these definitions, planning assumptions of that role that contributed to the recommendation of PPE are described. This description is important in that if the assumptions do not meet the operation of a jurisdiction, it may be necessary to define personnel into a different mission.

Following the assumptions, recommendations for specific PPE are made. Since we cannot recommend a specific manufacturer or model, recommendations are made in terms of the National Institute of Health (NIOSH) or National Fire Protection Association (NFPA) standard. Because of the length of these documents, they are not contained in the strategy, but are available to all response agencies.

For purposes of respiratory protection, all respirators recommended are full-face mask respirators.

This strategy DOES NOT recommend devices sold as escape masks for professional responders as there is insufficient history for these devices durability and service life and their performance in various weather conditions has not been evaluated.

Interoperability considerations are made to guide planning. Universal interoperability is difficult to impossible to achieve. Interoperability considerations are NOT exclusive. Planning should evaluate the probable needs and capabilities of support and interoperability. Some jurisdictions may focus interoperability with a local/geographic priority; that is interoperability within a community. Jurisdictions with robust discipline based mutual aid may conversely prioritize interoperability within and between the mission role or discipline.

Training requirements reflect the revised NFPA 472 standard. This standard underwent recent and extensive revision to broaden its applicability outside of the fire service to provide consistent and, again, interoperable training across the many functions of response to hazardous materials and CBRNE incidents. Recommended subcomponents of the core Operational training are selected based upon the mission role and assumptions.

Finally, a discussion section provides insight into the PPE, training and interoperability recommendations made. This information is provided to assist planners in understanding the recommendation and validating or deviating from the recommendations.

The PPE strategy should be viewed as a “living document.” NIOSH certification standards have not yet been released for all protective ensembles and changes will occur. Additionally, new products may provide improved protection and interoperability and should be continually evaluated to provide greater protection to our responders.

Duty Area		LAW ENFORCEMENT	
Mission Role:		FIRST RESPONDER/PATROL OFFICER	
Definition		Assumptions	
Initial Response into possible CBRNE incident in law enforcement capacity. Responder would have risk of exposure during the first response and initial phase of the event. Any requirement to work within the hazardous Environment beyond the initial recognition phase would generally result in the individual being reclassified into one of the other mission areas as defined in the matrix		Protection for those serving in the role is for personal escape. PPE requirements therefore focus upon rapid donning and critical protection. Protection is limited to respiratory protection as donning of chemical protective clothing would delay escape and would trap contaminants inside the PPE. Exposure to high respiratory hazard would preclude escape. If follow-on role is to be assumed without support, the minimum mission role protection should be for that follow-on mission role.	
Recommended Respiratory Protection	NIOSH CBRN full-face APR	Recommended Personal Protective Clothing	None
Interoperability Consideration	Other LE Agencies, local fire, other LE mission roles	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> Core competencies <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.134
Discussion			
<p>The PPE objective for this mission role is to provide the responder with rapidly deployable respiratory protection for escape to a safe area. This recommendation assumes that a patrol officer should not be knowingly dispatched into a contaminated area, but will likely become aware of contamination based upon observations or other reports. This should prompt the officer to seek immediate escape to a safe area.</p> <p>A full-face NIOSH CBRN approved air-purifying respirator is recommended as it requires little storage space or maintenance and can be rapidly donned to enable escape. While protection is limited against high respiratory hazards, the lower protection level is weighed against the ability to rapidly don protection and effect escape.</p> <p>Chemical protective clothing is not recommended for this mission role as the time to don such clothing while within a contaminated, and resulting dose contamination, area will outweigh the potential benefit. This delay is coupled with the probability that contamination is likely to remain inside the protective clothing if donned in a contaminated area.</p> <p>If the officer is to immediately assume other duties, without the support of additional equipment, the officer should carry the protection for that mission role while serving in the patrol function.</p>			

Duty Area		LAW ENFORCEMENT	
Mission Role:		FORCE PROTECTION	
Definition		Assumptions	
Force protection at a CBRNE incident scene or at critical supporting infrastructure locations (e.g. medical, communications, logistical support, staging or command and control locations) and access control points for the purpose of ensuring the safety of operating personnel and assets.		Positions described under the definition of Force protection should be established under the incident command system and located in safe zones (well outside of anticipated contamination and risk). Under such conditions, no PPE should be required. Unanticipated exigency, i.e. wind shift or secondary device, create a potential need for persons serving in these positions to require protection for escape into a safe area.	
Recommended Respiratory Protection	NIOSH full face CBRN APR or CBRN PAPR	Recommended Personal Protective Clothing	NFPA 1992 – Level C or NFPA 1994 – Class 3
Interoperability Consideration	Other LE Agencies, local fire, other LE mission roles	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> Core competencies <u>NFPA-Mission Specific Competency</u> <ul style="list-style-type: none"> Personal Protective Equipment <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
<p>When properly established, force protection roles as defined herein should be under no danger of exposure or contamination. However, as discussed under assumptions, we cannot discount the potential of conditions that unexpectedly place persons serving in this mission role in a position of exposure and in need of protection for escape.</p> <p>Under similar logic to that of a patrol officer, personnel serving in the force protection role should not intentionally enter an area of potential contamination. In the event of a rapidly developing situation, requiring escape, the priority for protection should be respiratory protection. Stopping within a contaminated area to don chemical protective clothing delays escape, increases the exposure and ultimately may only serve to trap contaminants within the protective clothing. Thus the recommendation for Force protection is for an escape respiratory protection capability.</p>			

Duty Area		LAW ENFORCEMENT	
Mission Role:		PERIMETER CONTROL	
Definition		Assumptions	
Scene control, credentialing, perimeter security, and crowd control.		Perimeter control is a vague term and can exist at multiple levels of risk. In the ideal, perimeter control will be sufficiently established as to be well outside of a hazard risk, requiring a low level of protection. However, reality dictates that perimeter control in the early stages of an incident may occur at the very limits of the hazard area. Accordingly, perimeter control in this strategy will reflect a wide range of protection to provide safe operations in close, where conditions may be questionable, to more distant perimeters where length of stay dictates a more sustainable, yet lower, level of protection.	
Recommended Respiratory Protection	NIOSH CBRN SCBA NIOSH CBRN PAPR NIOSH CBRN full-face APR	Recommended Personal Protective Clothing	NFPA 1992 – Level B and Level C NFPA –1994 – Class 2 NFPA –1994 – Class 3 .
Interoperability Consideration	Other L.E Agencies, local fire, other LE mission roles	Training & Administrative Requirement	<u>NFPA 472 – Operations Level</u> <ul style="list-style-type: none"> Core Competencies <u>NFPA 472 – Mission Specific Competencies</u> <ul style="list-style-type: none"> Air monitoring Personal Protective Equipment <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
The perimeter of a CBRN incident is often difficult to define and will evolve over the course of the incident. During the evacuation phase of an incident, the perimeter may be dangerously close to the hazard. As control is gained and risks defined, the perimeter should be re-established at a safe distance. This variability in definition requires a variable level of protection and ideally personal detection. Personal detection may be in the form of chemical reactive strips (colormetric) and/or electronic detection. The ensemble may be established through interchangeable components in respiratory protection allowing the user to increase or decrease protection level based on detected or perceived risk. Chemical protective clothing, while not at the entry level, should be sufficient to protect from vapor intrusion should a vapor hazard to skin exist.			

Duty Area		LAW ENFORCEMENT	
Mission Role:		EVIDENCE TECHNICIAN	
Definition		Assumptions	
Sample and evidence collection in cold, warm, and hot zones. These technicians may be involved in a variety of investigative processes including criminal investigation and environmental sampling.		Personnel serving in this mission role for CBRNE incidents are highly specialized. Evidence technician for CBRNE events and hazardous materials releases will be part of an established team selected and trained for this mission and its expected operating conditions. This is not an ad hoc assignment of those who otherwise serve as investigators.	
Recommended Respiratory Protection	NIOSH CBRN SCBA, NIOSH CBRN PAPR, NIOSH CBRN APR	Recommended Personal Protective Clothing	NFPA 1991 – Level A NFPA 1992 – Level B and Level C
Interoperability Consideration	Hazmat Teams, CST, FBI and state and local Law Enforcement.	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> ▪ Core competencies <u>NFPA 472 – Mission Specific Competencies</u> <ul style="list-style-type: none"> ▪ Personal Protective Equipment ▪ Air Monitoring ▪ Evidence Preservations and Sampling <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
<p>NFPA 472 – 2008 Edition describes a set of core competencies for all operations level responders and section 6.5 describes additional Mission Specific Competencies: Evidence Preservation and Sampling and section 6.9 Mission Specific Competencies: Respond to Illicit Laboratories Incidents.</p> <p>While evidence collection and crime scene processing would ideally be conducted after risk reduction and under close environmental monitoring so as to allow a reduction in PPE, we cannot be certain that the need for rapid investigation will always permit such delay and assurance. Accordingly, Evidence Technicians operating or expected to operate at a CBRN or hazardous materials incident should be able to operate under the highest level of protection.</p> <p>Because of the operating limitations and physical hardship of operating in high levels of PPE, Evidence Technicians should be trained and equipped with a full range of PPE in order that the appropriate level of protection can be selected in consideration of exposure risk and other operating factors.</p>			

Duty Area		LAW ENFORCEMENT	
Mission Role:		TACTICAL (SWAT)	
Definition		Assumptions	
Entry into any zone for immediate tactical action, hostage rescue, or assault.		The wide array of potential scenarios under which tactical operations may be carried out hold a unique set of risks. While tactical operations under a time limited air supply are not desirable, circumstances may present a potential release that cannot be otherwise detected. The interoperability of tactical units includes regional, state and federal teams.	
Recommended Respiratory Protection	NIOSH CBRN SCBA NIOSH CBRN PAPR NIOSH CBRN APR	Recommended Personal Protective Clothing	NFPA 1991 – Level A NFPA 1992 – Level B and Level C NFPA 1994 – Class 2 NFPA 1994 – Class 3
Interoperability Consideration	Hazmat Team Bomb Squad Other Tactical Teams	Training & Administrative Requirement	<u>NFPA 472 - Operations Level</u> <ul style="list-style-type: none"> Core Competencies <u>NFPA 472 - Mission Specific Competencies</u> <ul style="list-style-type: none"> Personal Protective Equipment Air Monitoring Technical Decontamination <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
<p>The law enforcement tactical mission role present unique challenges where its role takes it into environments where no knowledge of a hazard may exist. Hazard and Risk assessment for tactical operations therefore requires intelligence of what MAY be present not necessarily what has been released. Accordingly, the PPE strategy for this mission role must be based upon the highest level of protection that can practically be afforded within the physical and other requirements of tactical operations. It must be realized that tactical requirements MAY place persons operating in this role in positions that immediately exceed their PPE capabilities, but that such must be balanced against stealth, mobility and visibility.</p>			

Duty Area		FIRE DEPARTMENT	
Mission Role:		FIRE RESPONDER/FIREFIGHTER	
Definition		Assumptions	
Initial response in fire service capacity. Responders would have risk of exposure during the initial stages of the event. Any requirement to work within the hazardous environment beyond the first response and initial recognition phase would generally result in the individual being reclassified into one of the other mission areas defined in this matrix.		Definition is heavily dependent upon initial recognition and change in mission role based upon recognition. SCBA when properly utilized provides a high degree of respiratory protection from toxic industrial chemicals (TICs). SCBA will degrade in the presence of chemicals weapons if not CBRN certified. FF Structural protective clothing provides liquid splash protection, but does not protect against vapors and may suffer degradation in the presence of TICs. Protection from CBRN at this mission role is escape.	
Recommended Respiratory Protection	NIOSH CBRN SCBA	Recommended Personal Protective Clothing	NFPA 1971 Structural with CBRN option and worn with NIOSH CBRN SCBA
Interoperability Consideration	Mutual Aid departments, Law Enforcement, EMS, and Hazmat Teams	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> Core competencies, <u>NFPA 472 - Mission Specific Competencies</u> Personal Protective Equipment <u>NFPA 1001</u> <u>NFPA 1852</u>
Discussion			
<p>It is critical, yet difficult, to restrict fire fighting activities and protect fire fighters from CBRN in this role. Despite the routine use of protective equipment, the fire fighting protective ensemble (FFPE) is not designed nor intended for protection against chemicals. The higher level of respiratory protection listed is so listed because it is normal operating equipment for fire fighters versus the APR recommended for other mission roles. This does not imply and should not be used as reason to extend fire fighter exposure to a CBRN environment. Decontamination conducted in FFPE should be standoff decontamination using the MFA RAM Decon procedure until or unless it is determined that FFPE can be safely used through agent identification.</p>			

Duty Area		FIRE FIGHTING	
Mission Role:		RESCUE TEAM	
Definition		Assumptions	
Response to incidents for the purpose of rescuing live, non-ambulatory, casualties.		Distinct companies from Fire Responder/fire fighting companies, and/or specialty duty. Mission role may reside in specific rescue companies or be established through the formation of task forces. Rescue function under CBRN is a distinct duty and does not assume that all fire rescue companies may perform this mission role. Rescue for CBRN will be specifically equipped and trained in that function	
Recommended Respiratory Protection	NIOSH CBRN SCBA	Recommended Personal Protective Clothing	NFPA 1994 Class 2 worn with NIOSH CBRN SCBA or NFPA 1971 with CBRN Option worn with NIOSH CBRN SCBA
Interoperability Consideration	Mutual Aid departments, Law Enforcement, EMS, and Hazmat Teams	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> ▪ <u>Core competencies</u> <u>NFPA 472 – Mission Specific</u> <ul style="list-style-type: none"> ▪ Personal Protective Equipment ▪ Air Monitoring ▪ Victim Rescue and Recovery <u>NFPA 1001</u> <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
NFPA 472 – 2008 Edition describes a set of core competencies for all operations level responders and section 6.8 describes additional Mission Specific Competencies: Victim Rescue/Recovery. Training for this function may be deemed appropriate at a local or regional level, depending upon fire department resources. The protection requirement for this function must provide for entry into an unknown chemical environment and will necessitate some degree of detection as well as protection.			

Duty Area		FIRE FIGHTING	
Mission Role:		RAPID ACCESS MASS DECONTAMINATION (RAM)	
Definition		Assumptions	
Initial gross decontamination by first responding fire companies using standoff methods employing fire fighting hoses lines and fixed appliances. Any requirement to work within the hazardous environment beyond the use of standoff methods in a safe area would generally result in the individual being reclassified into other missions within this matrix.		Personnel conducting Rapid Access Mass Decontamination do not handle or have direct contact with potentially contaminated victims. Decontamination is carried out in a safe location and personnel do not enter contaminated areas.	
Recommended Respiratory Protection	NIOSH CBRN SCBA	Recommended Personal Protective Clothing	NFPA 1971 with CBRN option worn with CBRN SCBA
Interoperability Consideration	Mutual Aid Fire companies	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> Core competencies, <u>NFPA 472 – Mission Specific</u> <ul style="list-style-type: none"> Personal Protective Equipment Mass Decontamination <u>NFPA 1001</u> <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
Rapid access mass decontamination (RAM) was specifically developed to allow first arriving fire companies to carry out gross decontamination of large numbers of ambulatory casualties or potentially contaminated persons. A requirement of RAM decon is that the “victim” must be able to move under their own power through the decontamination line. Persons who are unable to do so are subject to rescue and casualty decontamination. When established and operated under established methods, fire fighters should not have an exposure to contamination. FFPE and SCBA are worn to protect against inadvertent exposure in low quantity.			

Duty Area		FIRE FIGHTING	
Mission Role:		MASS DECONTAMINATION UNIT	
Definition		Assumptions	
Fire Fighter or others (see Emergency Medical and/or Hospital) assigned to perform decontamination and operate a Massachusetts issued Mass Decontamination Unit (MDU) either at an incident or at an acute care hospital.		The MDU is established in the warm zone (contamination reduction zone) of an incident or at a hospital. Victims will be removed from contaminated areas by rescue teams and may undergo RAM or gross decontamination prior to presenting at the MDU. Personnel operating the MDU may be composite of fire, medical personnel and skilled support personnel.	
Recommended Respiratory Protection	NIOSH CBRN PAPR	Recommended Personal Protective Clothing	NFPA 1992 – Level C NFPA 1994 – Class 3
Interoperability Consideration	Medical Responders/ Receivers Mutual aid MDUs	Training & Administrative Requirement	<u>NFPA 472 Operational Level</u> <ul style="list-style-type: none"> Core competencies <u>NFPA 472 – Mission specific</u> <ul style="list-style-type: none"> Personal Protective Equipment Mass Decontamination <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
At the outset, the MDU response plan established SCBA as the minimum respiratory protection. This was based on OSHA 1910.120 requirements and absent interpretive guidelines specific to victim decontamination. Subsequent recommendations from OSHA and the military establish that “generally,” air-purifying respirators are sufficient as receivers of casualties for decontamination are not within the contaminated area and the concentration of agents on contaminated victims will not generate an atmosphere requiring SCBA. Powered air purifying respirators are recommended in this strategy for this particular Mission Role to provide less fatigue to the wearer performing labor-intensive decontamination functions.			

Duty Area		EMERGENCY MEDICAL SERVICES	
Mission Role:		FIRST RESPONDER/MEDICAL FIRST RECIEVER	
Definition		Assumptions	
Initial response in medical services capacity; responding to a report of an incident or being the first medical person to receive or recognize casualties from a CBRNE event. Responders would have risk of exposure during the initial phases of the event. Any requirement to function in another capacity beyond the initial recognition phase would generally result in the individual being reclassified into one of the other mission areas defined in this matrix		First responder/ medical first receiver, for purposes of this strategy excludes any primary EMS responder. A primary EMS responder is one who serves an EMS vehicle, public or private, that is staffed for the express purpose of answering emergency calls from the public. A primary EMS responder, in this strategy, is automatically reclassified into contaminated care.	
Recommended Respiratory Protection	NIOSH CBRN FULL-FACE APR	Recommended Personal Protective Clothing	CDC UNIVERSAL PRECAUTION
Interoperability Consideration	Primary EMS Providers, Ambulance Task Force members, local law enforcement and fire services	Training & Administrative Requirement	<u>NFPA 472 – Operations Level</u> <ul style="list-style-type: none"> ▪ Core Competencies NFPA 472 – Mission Specific <ul style="list-style-type: none"> ▪ Personal Protective Equipment <u>NFPA 473</u> <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.134
Discussion			
<p>The separation and automatic assignment in this strategy of “primary” EMS responders into the “Contaminated Patient Care” mission role seeks to recognize that primary EMS responders will be confronted, immediately, by contaminated victims and will likely have no opportunity to retreat from that contact. This reality increases the necessary baseline level of PPE required for “Contaminated Patient Care” specific Mission Role and would be an unreasonable expectation to be sustained on those ambulances that do not perform a primary EMS function. While EMS providers not within the primary role would likely be called upon in mutual aid to a large event, it is far less likely that they will encounter contaminated patients without the opportunity to increase PPE and reclassify into the contaminated care mission role. Additionally, decontamination is much more likely to be in place when secondary EMS providers arrive.</p>			

Duty Area		EMERGENCY MEDICAL SERVICES	
Mission Role:		CONTAMINATED PATIENT CARE	
Definition		Assumptions	
<p>The medical provider or allied medical professional (e.g. medical examiner, primary EMS responder) at any location or level of response who is likely to provide care or service to patients or victims who are likely to pose a significant risk of secondary contamination or exposure. These medical personnel may also be involved in the decontamination process.</p>		<p>Contaminated care is performed outside of a contaminated area (hot zone). Contaminated care may include medical care for victims at the scene of an event, at a victim decontamination location and/or at sites remote from the incident. While contaminated medical care is not desirable, it is necessary to recognize that it is probable that initial EMS responders will be confronted by contaminated casualties at the primary site requiring immediate medical care and that contaminated casualties may present remote from the site and at hospitals.</p>	
Recommended Respiratory Protection	NIOSH full face CBRN APR or CBRN PAPR	Recommended Personal Protective Clothing	NFPA 1999 NFPA 1992-Level C
Interoperability Consideration	Other medical responder/receiver, local law enforcement, fire services and hospital first receivers	Training & Administrative Requirement	<u>NFPA 472 Operations Level</u> <ul style="list-style-type: none"> Core Competencies <u>NFPA 472 – Mission Specific</u> <ul style="list-style-type: none"> Personal Protective Equipment <u>NFPA 473</u> <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.134
Discussion			
<p>OSHA and the military have provided guidance on contaminated care. Current guidance establishes the appropriate respiratory protection with air purifying methods. It is critical to understand that this guidance also assumes that contaminated care is prior to and not in the absence of decontamination, as it is based on the concentrations of vapors from off gassing. Bringing contaminated patients into a closed environment such as a hospital or ambulance without decontamination poses the risk of developing a hazardous atmosphere and may require higher respiratory protection. All published guidance also recognizes that air purifying respirators have limitations and that a few chemicals cannot be protected against with air purification. Appropriate training to judge when such limitations are exceeded is imperative.</p>			

Duty Area		EMERGENCY MEDICAL SERVICES	
Mission Role:		NON-CONTAMINATED CARE	
Definition		Assumptions	
<p>The medical care provider or allied health professional (e.g. medical examiner) at any location or level who is likely to provide care or services to patients or victims who do not pose a significant risk of secondary contamination or exposure. The determination of lack of significant risk may be based upon a wide variety of factors including, but not limited to, the proximal location of the patient/victim at the time of CBRNE release, the physical/chemical properties of the CBRNE, the use of detection equipment or the extent of decontamination already taken.</p>		<p>Active determination at each step of medical care will be carried out to establish, confirm and communicate the lack of a contamination risk. Any indication of a change in conditions (i.e. loss of control of patient/victim access to care at this location such that detection and or decontamination cannot be assured) will cause a change in mission role to contaminated care.</p> <p>Procedures, training and equipment should be available to adjust the mission role as necessary.</p> <p>PPE is CDC universal precaution.</p>	
Minimum Respiratory Protection	NIOSH APR N or P99-Nor P100	Minimum Personal Protective Clothing	CDC universal precaution
Interoperability Consideration	Contaminated Care	Training & Administrative Requirement	<u>NFPA 472</u> Awareness Level <u>OSHA</u> 29 CFR 1910.134
Discussion			
<p>The presence of this mission role in the strategy serves to recognize that a point of no threat must be established wherein the medical care provided can return to “normal.” Yet even under clinical or fielded medical areas where this level is expected, provisions and training should be in place to monitor that condition and protect personnel if the condition of non-contaminated inadvertently changes or is suspected of change in order that adjustments can be made and medical care continued.</p>			

Duty Area		FOLLOW-ON RESPONDERS	
Mission Role:		ADMINISTRATIVE/LOGISTICAL SUPPORT PERSONNEL	
Definition		Assumptions	
Those individuals that would follow-on in the response to assist with the administration and logistical support of the event. These individuals would not normally be subject to potential exposure provided appropriate force protection and perimeter security measure are in place.		Operation of follow-on support and administrative function should be established well beyond any potential area of contamination. Follow-on administrative and support personnel may have no training in PPE. Continual monitoring should detect any change in conditions. Personnel in these mission roles may have discipline specific mission roles to transition into. Any PPE consideration would be escape only	
Minimum Respiratory Protection	Consider available NIOSH CBRNE Escape respirators	Minimum Personal Protective Clothing	None
Interoperability Consideration	None	Training & Administrative Requirement	<u>NFPA 472</u> – Awareness Level <u>OSHA</u> 29 CFR 1910.134 if respiratory protection is issued
Discussion			
While many persons with other response duties may function in the Administrative and Logistics mission role, such personnel should fully transition roles when operating as such. The administration/logistics mission role of follow-on responders should be in a clear safe area. An evaluation of potential expansion or secondary events may lead to the conclusion that escape respirators should be on-hand. If the operating area cannot be further removed to increase safety, escape respirators on on-site training may be necessary.			

Duty Area		FOLLOW-ON RESPONDERS	
Mission Role:		TECHNICAL AND SKILLED SPECIALTY PERSONNEL – ISOLATION AREA	
Definition		Assumptions	
Those trade personnel called upon to provide a focused specialty function. These functions would likely be carried out in the isolation area of the event and therefore, potential exposure to materials are likely.		The type and source of specialty personnel cannot be predetermined. Specialty personnel will not have prior PPE training or their own equipment. Specialty personnel will only enter and operate within the isolation area under expert supervision.	
Recommended Respiratory Protection	Situational determination	Recommended Personal Protective Clothing	Situational determination
Interoperability Consideration	Hazmat Team, Rescue team, Investigators	Training & Administrative Requirement	On-site orientation to PPE and hazards
Discussion			
As described in the definition, Technical and Skilled Specialty Personnel may come from a wide array of trades and occupations. The skills and origin of such personnel cannot be definitively limited; though the most common can be identified. It is also difficult to narrowly define the exposure hazards that they personnel may encounter, as their capabilities may be needed at various stages of various incidents. Ultimately, it is not practical for the state to attempt to impose a strategy on skilled support personnel. The strategy should reflect the recognition that such needs will necessarily be met at the time, by those capable of supporting personnel in this role.			

Duty Area		FOLLOW-ON RESPONDERS	
Mission Role:		TECHNICAL AND SKILLED SPECIALTY PERSONNEL – NON- ISOLATION AREA	
Definition		Assumptions	
<p>Those trade personnel called upon to provide a focused specialty function. These functions would not normally be subject to potential exposure provided appropriate force protection and perimeter security measures are in place.</p>		<p>The type and source of specialty personnel cannot be predetermined. Specialty personnel in this mission role may be numerous and function for short intervals.</p> <p>It would be highly personnel and equipment intensive to provide PPE to those in this role</p>	
Recommended Respiratory Protection	None	Recommended Personal Protective Clothing	None
Interoperability Consideration	Technically Skilled Specialty Support Personnel in Isolation area, Administrative/Log istics Personnel	Training & Administrative Requirement	On-site orientation to site safety plan, including evacuation signals and routes
Discussion			
<p>As described in the definition, Technical and Skilled Specialty Personnel may come from a wide array of trades and occupations. The skills and origin of such personnel cannot be definitively limited, though the most common can be identified. By definition, the risk of exposure should not be present. As such personnel may transition in their roles more quickly than those in the isolation area, the measures necessary to provide PPE training and equipment would not be reasonable in terms of the commitment of personnel time and equipment to accomplish it. ALL PERSONNEL OPERATING WITHIN THE PERIMETER SHOULD BE ADVISED OF THE SITE SAFETY PLAN, INCLUDING EVACUATION PROCEDURES.</p>			

Duty Area		SPECIAL	
Mission Role:		HAZARDOUS DEVICE OPERATIONS	
Definition		Assumptions	
Response to incidents involving a hazardous explosive and/or dispersal device within the isolation area, for the purposes of identification, rendering safe, or removal of such device(s). For operations outside of the isolation area, PPE requirements are set by the mission role		Standards for training, personal protective equipment for certified Hazardous Device Technicians are set by the FBI and National Bomb Squad Commanders Association. This strategy will defer to those entities and the standards that they establish for equipment and training.	
Recommended Respiratory Protection	See Assumptions	Recommended Personal Protective Clothing	See Assumptions
Interoperability Consideration	Hazmat Team Medical Support Tactical Team	Training & Administrative Requirement	NFPA 472 Hazardous Materials Technician
Discussion			
Standards for Hazardous Device Technicians are established on a national basis. The training for this mission role is closely managed and well regulated to provide a national interoperability. It is counterproductive for a state strategy to be established that may not concur or remain current with the national standard.			

Duty Area		SPECIAL	
Mission Role:		HAZARDOUS MATERIALS OPERATIONS	
Definition		Assumptions	
<p>Response to incidents involving CBRNE or hazardous materials within the isolation area for the purposes of detection, sampling, identification, control, and/or remediation. For operations outside of the isolation area, PPE requirements are determined by the specific mission role</p>		<p>This mission role applies to members of a hazardous materials response team operating under the Incident Command System during the emergency phase of the incident. PPE Individuals who may possess training and certification by their employer as hazardous materials technician, but are not operating as part of an organized hazardous materials team are addressed by the mission role that they are performing. The capabilities of a Hazardous Materials Response Team should be commensurate with the resource typing level of that team as described in the NIMS Resource typing guide.</p>	
Recommended Respiratory Protection	Per hazard and risk assessment	Recommended Personal Protective Clothing	Per hazard and risk assessment
Interoperability Consideration	Other Hazmat Teams, CST, Hazardous Devices, Medical Support	Training & Administrative Requirement	<p>NFPA 472 – Hazardous Materials Technician</p> <p><u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134</p>
Discussion			
<p>The minimum competency requirements for a hazardous materials technician are established within 29 CFR 1910.120 and NFPA 472. However, neither of these descriptions specify the equipment capability of a hazardous materials team. As hazardous materials teams may differ among various jurisdictions, the NIMS resource typing guide should be used to establish capabilities. PPE requirements for hazardous materials teams are based upon the established operating capability of the team, not the individual.</p> <p>However, the team, and thus the member, must be trained equipped to operate in the environment and perform the functions set forth by the resource type. A lower level team may not be capable of performing in all environments as specialized PPE and capabilities may be required.</p>			

Duty Area		SPECIAL	
Mission Role:		INCIDENT COMMAND TEAM/UNIFIED COMMAND	
Definition		Assumptions	
Response to incidents for purposes of assuming incident command in the field, including establishment and operation of a field command center.		Operation of command functions, including the establishment of a command center or post, should be established well beyond any potential area of contamination. Special command, administrative and support personnel may have no training in PPE. Continual monitoring should detect any change in conditions. Personnel in these mission roles may have discipline specific mission roles to transition into. Any PPE consideration would be escape only	
Recommended Respiratory Protection	Consider available NIOSH CBRNE Escape respirators	Recommended Personal Protective Clothing	None
Interoperability Consideration	None	Training & Administrative Requirement	<u>NFPA 472</u> – Awareness Level
Discussion			
While many persons with other response duties may function in Command mission roles, such personnel should fully transition roles when operating as such. The Command mission role of special responders should be in a clear safe area. An evaluation of potential expansion or secondary events may lead to the conclusion that escape respirators should be on-hand. If the operating area cannot be further removed to increase safety, escape respirators on on-site training may be necessary.			

Duty Area		SPECIAL	
Mission Role:		URBAN SEARCH & RESCUE	
Definition		Assumptions	
Response to incidents in the isolation area involving collapsed structures for the purpose of locating and rescuing trapped victims, or structural stabilization.		<p>The Technical Rescue role, excluding Federal teams (subject to federal requirements), may reside in specific rescue companies or be established through the formation of task forces. Regional technical rescue teams may or may not include hazardous materials technicians. A combined operation would default to Hazmat Team requirements.</p> <p>Technical rescue teams may be engaged in unknown hazards and or both long and short-term operations. PPE requirements will be adjusted throughout the operation.</p>	
Recommended Respiratory Protection	NIOSH CBRN SCBA or supplied air NIOSH CBRN Closed circuit respirator.	Recommended Personal Protective Clothing	NFPA 1994 Class 2 worn with NIOSH CBRN SCBA NFPA 1971 with CBRN Option worn with NIOSH CBRN SCBA
Interoperability Consideration	Mutual Aid departments, Law Enforcement, EMS, and Hazmat Teams	Training & Administrative Requirement	<u>NFPA 472</u> Operations Level <ul style="list-style-type: none"> Core Competencies <u>NFPA 472</u> Mission Specific <ul style="list-style-type: none"> Personal Protective Equipment Air Monitoring Technical Decon Victim Rescue and Recovery <u>NFPA 1001</u> <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
<p>Technical rescue team requirements are essentially the same as those for fire rescue. The addition of confined space and prolonged operations places a greater need for flexibility upon technical rescue. This flexibility must be measured and done in consultation with Hazardous Materials team real-time measurement to determine the appropriate level of PPE at any given point of the operation or and specific location.</p>			

Duty Area		SPECIAL	
Mission Role:		ENVIRONMENTAL/OCCUPATIONAL HEALTH OPERATIONS	
Definition		Assumptions	
<p>Response to incidents involving CBRNE or hazardous materials in order to gather data/samples for the purposes of assessing human health risks to responders or the community. These activities generally occur at a secured scene after the completion of initial emergency response activities.</p>		<p>This mission role refers to established health surveillance teams with prior operating plans, training and equipment. The existence of this mission role does not suggest that this is a capability that should exist at a local or regional level, though it may.</p> <p>This mission role assumes that such teams will operate within an isolation area under the supervision of a hazardous materials response team; local, state or federal, with the capability of air monitoring and agent identification.</p>	
Recommended Respiratory Protection	NIOSH CBRN SCBA NIOSH CBRN PAPR NIOSH CBRN APR	Recommended Personal Protective Clothing	NFPA 1992 – Level B or NFPA 1992 – Level C NFPA 1994 – Class 2 NFPA 1994 – Class 3 NFPA 1994 – Class 4
Interoperability Consideration	Hazmat Teams, CST	Training & Administrative Requirement	<u>NFPA 472 – Operations Level</u> <ul style="list-style-type: none"> Core competencies <u>NFPA 472 Operations Mission Specific</u> <ul style="list-style-type: none"> Personal Protective Equipment Air monitoring <u>OSHA</u> 29 CFR 1910.120 29 CFR 1910.132 29 CFR 1910.134
Discussion			
<p>Persons operating in this mission role will have specialized functions of sampling and data collection for health and environmental assessment. They may or may not have specialized detection equipment, but when operating at a defined hazardous materials or CBRN event, would/should do so as part of the overall operation and in coordination with other operations. As identified in NFPA 472 Chapter 6, “Competencies for Operations Level Responders Assigned Mission-Specific Responsibilities”, it is expected that personnel in this mission role would generally operate in the isolation area under the guidance of a hazardous materials technician, an allied professional, an emergency response plan, or standard operating procedures.</p>			