The 2004 Standardized Equipment List (SEL)

Foreword

The Standardized Equipment List (SEL) is provided to the responder community by the InterAgency Board for Equipment Standardization and Interoperability (IAB). The SEL contains a list of generic equipment recommended by the IAB to local, state, and federal government organizations in preparing for and responding to Weapons of Mass Destruction (WMD) events.

The SEL is a guideline, and its use is voluntary. The SEL promotes interoperability and standardization across the response community at the local, state, and federal levels by offering a standard reference and a common set of terminology. The IAB does not assume any liability for the performance of the equipment items mentioned in the SEL.

The SEL is issued annually to reflect maturing and emerging technologies. Government organizations may present suggested changes at any time for consideration.

The 2004 SEL

The SEL has traditionally been published as part of the IAB's Annual Report. In previous years, the SEL's year corresponded with the year of the Annual Report. Since annual reports are published several months after the close of the calendar year, the year created some confusion. To avoid any further confusion, the SEL year is current with the year in which it was developed. Therefore, the 2004 SEL will be published in the 2003 Annual Report. The 2004 SEL is the most current SEL produced by the IAB.

Section Numbering for 2004 SEL

The 2004 SEL has nine sections versus the six sections in the previous edition. They are:

1. Personal Protective Equipment
2. Operational Equipment
3. Information Technology
4. Communications
5. Detection Equipment
6. Decontamination
7. Medical
8. Power
9. References

The new scheme reflects three changes:

- Interoperable Communications and Information Systems were divided into separate sections. While the two types of technology remain very closely related, this change simplifies the search for specific equipment items.
- Section 8 was added to consolidate power equipment such as generators and batteries, which previously appeared in multiple sections.
- Section 9 was added to provide a separate, easy-to-find section for references.

SEL Numbering Scheme

The 2004 SEL continues the numbering scheme introduced in the previous version. Many individual items will have different numbers this year, primarily due to the changes in section numbers. This scheme allows the IAB to group SEL items into related sets, and is also used in the on-line interactive version of the SEL (see below). The format for SEL number is 99xx-88-yyyy, where:

99 is the section number, from 01 through 99 (currently 01 through 09 are used).

xx is the category. It is alphanumeric and unique within its section. For example, within Personal Protective Equipment, all items associated with the "NFPA 1994 Class 1 Ensemble" will have the category "C1".

88 is the numeric subcategory. For example, within the Personal Protective Equipment Section's NFPA 1994 Class 1 Ensemble, the "Required Items" will all have a subgroup code of "01". This code may be set to "00" when not required.

yyyy is the item identifier. It is alphanumeric and unique within its section, class, and group. Using an alphanumeric code at this level increases flexibility, and decreases the chance of human error. For example, the Hard Hat in the personal protective equipment section uses the item identifier "HHAT."

"New and Improved" Content and Matrices

The "New and Improved" 2004 SEL has been augmented with additional information to assist responders in selecting equipment items. Many of the equipment items now contain information such as:

- Current Standards (where they apply), provided in a footnote-style number reference to a standards list furnished at the end of the SEL
- Features, which lists preferred operational features for the equipment items that are important to usability or interoperability, and
- Operating Considerations, which provides general guidance in planning, selecting, or utilizing the specific equipment item.

The use of these new fields varies among the SEL sections. However, each section includes some information in these new fields, and the quantity and quality will improve in each new edition.

The other major enhancement to the SEL content this year is the development of selection matrices for SEL items. With the exception of Section 8 (Power), each section of this year's SEL has a matrix to assist in selecting items. The rows and columns of each matrix reflect the specific type of items in the section. The definitions used in each section's selection matrix are included in the introduction to that SEL section.

The On-Line, Interactive SEL

In addition to this printed version, the 2004 SEL is accessible on-line as part of the Responder Knowledge Base (RKB) developed through the National Memorial Institute for the Prevention of Terrorism (MIPT). The web address is www.rkb.mipt.org. The on-line version includes all of the equipment information, and implements the selection matrices interactively. It also provides links to related standards, products, grants, and other equipment-related information. The 2004 SEL is also available in a pdf format.

Summary

The 2004 SEL represents the collective effort of the InterAgency Board members and several related support organizations. The "New and Improved" SEL provides a significant increase in content and functionality for all members of the responder community. Like all previous versions, the 2004 SEL is intended to provide the best possible information in support of all those who may be called in response to a WMD incident. Suggestions and comments are welcome.

Overview

Currently, there is no single personal protective ensemble that protects the wearer from exposure to all hazards. Early ensemble descriptions used over-simplified definitions such as OSHA/EPA Level A, B, C, and D. The descriptive narrative in these levels does not set minimum performance criteria required for specific threats, such as chemical permeation resistance and physical property characteristics. The use of these general "levels" of protection does not assure that the wearer is adequately protected from any specific hazards. In addition, over-reliance on these nomenclatures could result in responder exposure above acceptable exposure limits or an unnecessary reduction in operational effectiveness through lack of mobility, decreased dexterity, and reduced operational mission duration.

Proper selection of Personal Protective Equipment (PPE) should not rely upon simple "levels of protection." It must be based upon a careful assessment of two factors: 1) the hazards anticipated to be present at the scene and, 2) the likelihood that those hazards will impact personnel.

Expanded Content

This year's section includes several new fields designed to assist readers in selecting appropriate equipment items:

- Standards - where possible, applicable standards are listed by providing a reference number that can be used to find the standard in the listing at the end of the SEL. The list includes both "product" standards (i.e., standards to which a given item can be certified), and "use/care" standards (i.e., standards that provide guidance on utilization, maintenance, transportation, etc.).
- Features - lists desirable characteristics or capabilities of the item.
- Operating Considerations - other relevant information regarding the procurement or use of the specific item, such as safety issues, limitations, special characteristics, etc.

The Hazard/Mission Matrix

In an effort to make this section more helpful in selecting and purchasing equipment, this year's edition includes the use of a Hazard/Mission matrix. This matrix utilizes two assessment factors that must be addressed for appropriate ensemble selection. First, the hazard or threat, including the likely physical state in which it would present itself, forms the "Hazard Environment" axis of the matrix. Then, the hazard/risk assessment is completed by combining the weapon or "hazard" characteristics against the likelihood of exposure based upon generalized job functions. These job functions are represented by the "Mission Roles" axis of the matrix. Matching a mission role to one or more hazard environments gives a recommended set of equipment items. Where possible, each item identifies established performance standards for its manufacture, selection, and use.

Hazard Considerations (The Hazard Environment Axis)

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/X-Ray" 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 for use in the SEL:

HAZARD ENVIRONMENT DEFINITIONS

Category	Environment	Definition
Chemical	Vapor/Gas/Aerosol (High Respiratory, High Dermal) [VH]	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* 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 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* suggests that the airborne concentration is anticipated to be below IDLH levels. *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 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* refers to 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* refers to 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* suggests that the concentration is above respiratory IDLH levels, or that the toxin 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* suggests that the concentration is below respiratory IDLH levels, and that the toxin is non-carcinogenic.

HAZARD ENVIRONMENT DEFINITIONS - Continued

Category	Environment	Definition
Biological	Airborne [BA]	Microorganisms that can be spread as aerosols or particulates, and 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.
	Penetrating Gamma/X-Ray [yX]	The threat from gamma/x-ray ionizing radiation consists of both exposure to and contamination by gamma and x-ray-emitting radioactive isotopes. Other than time, distance, and shielding, PPE is limited to minimizing direct contact with or inhalation of contaminated material.
Thermal	Flash Fire [FF]	A relatively short duration fire of 10 seconds or less that involves the ignition and combustion of a flammable atmosphere.
	Sustained Fire [SF]	A fire involving a structure or other source of materials that continues for a period of 1 minute or more until extinguished or through the consumption of the combustible materials present.
Explosive	Pre-Detonation [PR]	The potential for explosion still exists at the emergency scene.
	Post-Detonation [PO]	The device has already exploded and the response scene involves the physical hazards associated with structural collapse and debris.
Ballistic	Armed Assaults, Force Protection, Hostage Rescue [AS]	Handgun and rifle fire up to and including .30 Caliber armor piercing rounds.

Risk/Level of Exposure to the Hazard (The Mission Role Axis)

For a more detailed risk assessment of responders at WMD events, it is necessary to describe each responder's particular mission. 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 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 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.

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

MISSION ROLE DEFINITIONS

Duty Areas	Mission Role	Definition
Law Enforcement	First Responder/ Patrol Officer	Initial response into possible WMD 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 WMD 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 incident for purpose of rescuing live non-ambulatory casualties.
	Decontamination Team	Decontamination of response personnel or victims.
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 WMD 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.

MISSION ROLE DEFINITIONS - Continued

Duty Areas	Mission Role	Definition
Emergency Medical Services	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 WMD release, the physical/chemical properties of the WMD, 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 the 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 WMD 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	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	Response to events in the isolation area involving collapsed structures for the purpose of locating and rescuing trapped victims, or structural stabilization.

MISSION ROLE DEFINITIONS - Continued

Duty Area	Mission Role	Definition
Special	Environmental/ Occupational Health Operations	Response to incidents involving WMD or hazardous materials in order to gather data/samples for the purpose 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.
	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.
	Community Emergency Response Team Members (CERT)	Members of community/neighborhood based response groups that provide community emergency response during overwhelming natural disasters or major emergencies.

The Hazard Environment Axis and Mission Role Axis form a large classification matrix for PPE equipment items. The figure on the following page is provided to assist readers in visualizing the complete selection matrix.

NOTE: Because of the size of the Hazard/Mission matrix, it is impractical to display it for each item in the printed version of the SEL. However, the matrix data has been stored in the on-line version of the SEL (in the Responder Knowledge Base, at www.rkb.mipt.org), and can be used for selection of items by mission role and hazard environment. The details of the Mission and Hazard definitions are presented here to assist readers in understanding the framework used by the PPE Subgroup in discussing WMD response and formulating the SEL content.

The Planning Process

Threat assessment and prior planning are essential. A community must first complete a thorough threat assessment that identifies the most probable scenarios before the Hazard/Mission matrix can be used for maximum benefit. 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 effort should produce an "inventory" of the most likely hazards, scenarios and anticipated responder roles. The results can then be applied to the Hazard/Mission matrix. Completing this organized process of assessing the threat, planning the response, and identifying equipment gaps as a prerequisite to equipment selection is strongly encouraged.

PPE Hazard/Mission Selection Matrix Template

HAZARD		Chemical							Biological		Radiological		Thermal		Explosive		Ballistic
MISSION ROLE		VH	VR	VL	LH	LL	PH	PL	BA	BL	AB	yX	FF	SF	PR	PO	AS
Law Enforcement	First Responder/Patrol Officer																
	Force Protection																
	Perimeter Control and Field Force																
	Evidence Technician																
	Tactical (SWAT)																
Fire Department	Fire Responder/Firefighter																
	Rescue Team																
	Decontamination Team																
Emergency Medical Services	First Responder/Medical First Receiver																
	Contaminated Patient Care																
	Non-Contaminated Patient Care																
Follow-On Responders	Administrative/Logistical Support Personnel																
	Technical and Skilled Specialty Personnel - Isolation Area																
	Technical and Skilled Specialty Personnel - Non-Isolation Area																
Special	Hazardous Device Operations																
	HAZMAT Operations																
	Incident Command Team																
	Urban Search and Rescue																
	Environmental/Occupational Health Operations																
	Epidemiology																
	Mortuary Operations																
	Community Emergency Response Team Members (CERT)																

PPE Standards and Hazard Environments

In addition to the Hazard/Mission matrix, this edition of the SEL updates the table relating hazards to existing standards. 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 WMD 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.

	Respiratory Protection			Personal Protective Clothing											
Exposure/Hazard	NIOSH CBRN-SCBA	NIOSH CBRN-APR[5]	NIOSH CBRN PAPR (Dec, 2004)[5]	NFPA 1991 w/ Chem/Bio Option	NFPA 1991 w/ Chem/Bio & Flash Fire Options	NFPA 1994 Class 1	NFPA 1994 Class 2	NFPA 1994 Class 3	NFPA 1992	NFPA 1951	NFPA 1999	DOD-Advanced Bomb Suit Performance Specification	NFPA 1971	NFPA 1976	NJ Standard 101 - Ballistic Protection
UNKNOWN ENVIRONMENT	X				X	X	X								
CHEMICAL															
Vapor/Gas/Aerosol (High Respiratory[1], High Dermal[4])	X			X	X	X									
Vapor/Gas/Aerosol (High Respiratory[1], Low Dermal[3])	X			X	X	X	X								
Vapor/Gas/Aerosol (Low Respiratory[2], Low Dermal[3])	X	X	✓	X	X	X	X								
Liquids (High)[6]	X			X	X	X	X								
Liquids (Low)[6]	X	X	✓	X	X	X	X	X	o						
Particulates (High)	X			X	X	X	X								
Particulates (Low)	X	X	✓	X	X	X	X	X	o	o	o		o	o	
BIOLOGICAL															
Airborne	X	X	X	X	X	X	X								
Liquid-borne	X	X	X	X	X	X	X	X		o	o		o	o	
RADIOLOGICAL															
Particulate/Liquid (Alpha and Beta)	X	X	X	X	X	X	X	X	o	o	o		o	o	
Penetrating Gamma/X-Ray															
THERMAL															
Flash Fire	X				X					o			o	o	
Sustained Fire															
EXPLOSIVE															
Pre-Detonation												o			
Post-Detonation										o			o	o	
BALLISTIC															
Armed Assaults, Force Protection, Hostage Rescue															X

Key to Matrix Values:

- X Provides protection from the indicated CBRN exposure.
- ✓ NIOSH PAPR CBRN requirements are expected in December, 2004.
- o Does not provide protection from CBRN exposures, but does provide protection from indicated exposures once the CBRN 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] "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 chronic health effects via skin contact (e.g. carcinogens).
[4] "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).
[5] Cartridges and canisters utilized for APRs and PAPRs may have significant life limitations in airborne particulate hazards of sufficient quantity to cause filter loading.
[6] With regards to liquid chemical hazards. Although expressed in this matrix in general terms, selection of respiratory levels of protection would be dependent volatility of the material and results of quantitative analysis of airborne concentrations.

Summary

Section 1 of the SEL is intended to provide the best possible guidance in selecting personal protective equipment based upon the anticipated hazard environment(s) and the mission role of the wearer. This year's SEL also includes additional information on each item. In addition to the title and description, we have added information on desirable features, operating limitations, and applicable standards. These additional fields are intended to enhance the utility of the SEL for all emergency responders.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C1 - NFPA 1994 Class 1 Ensembles 01 - Required Elements			
Ensemble, Chemical/Biological Protective, NFPA 1994 Class 1	01C1-01-ENSM NFPA 1994 Class 1 Chemical/Biological Terrorism Protective Ensemble, including totally encapsulating suit with attached gloves and footwear or booties with outer boots (certified as compliant with NFPA 1994). Other separate items, such as CBRN SCBA, are required.	Ensemble consists of suit that encapsulates wearer and wearer's breathing apparatus, combined with attached gloves, and boots or booties with outer boots. Ensembles include transparent visors, pressure-sealing zippers, and exhaust valves for release of wearer's respirator exhalation air. Ensemble is designed to be worn with CBRN self-contained breathing apparatus (CBRN SCBA). The position of the closure system will vary with the manufacturer. The overall suit is evaluated for gas-tight integrity and inward leakage (0.02% is permitted). Materials are evaluated for permeation resistance against high levels of chemical agents, liquid toxic industrial chemicals, and gaseous toxic industrial chemicals. --- Class 1 ensembles are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified and of unknown concentration. Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the SCBA. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,95
Footwear, Chemical/Biological Protective, NFPA 1994 Class 1	01C1-01-FTWR NFPA 1994 Class 1 Chemical/Biological Terrorism Protective Footwear, (certified as compliant with NFPA 1994). Must be part of a complete ensemble of clothing and other equipment.	Footwear may be attached to suits as part of an overall ensemble. Alternatively, the footwear system may consist of a bootie (sock-like extension of the suit) combined with an outer boot. The footwear system must provide a gas-tight interface with the suit. Footwear is evaluated as part of the ensemble for gas-tight integrity and inward leakage (0.02% is permitted). Materials are evaluated for permeation resistance against high levels of chemical agents, liquid toxic industrial chemicals, and gaseous toxic industrial chemicals. Footwear is further evaluated for physical properties (impact, abrasion, cut, puncture, cold temperature performance) and function (traction). --- Footwear as part of Class 1 ensembles is intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified and of unknown concentration. Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the SCBA. Only footwear certified with a particular ensemble may be worn with that ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,95

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C1 - NFPA 1994 Class 1 Ensembles 02 - Related Elements			
Hardhat	01C1-02-HHAT Hardhat (certified as compliant to ANSI 89.1)	Hardhat consists of shell with suspension; the suspension generally consists of a chin strap or nape strap (worn behind the head) or both. Some hardhats may contain padding for additional impact protection. --- Minimum hardhat should be a Class G (general). Hardhat is worn inside encapsulating suit for head protection. Selected suit must accommodate hardhat; the hardhat should not interfere with head movement or wearing of SCBA. Use of head protection should be in accordance with OSHA 29 CFR 1910.135.	47,67
Equipment, Inflation Testing	01C1-02-ITST Inflation testing equipment specific to Item 01C1-01-ENSM	Inflation testing equipment includes a pump or air source, a pressure gauge, tubing, and fixtures for attachment of tubing to suit. The kit permits the blockage of exhaust valves and inflation of the suit to check gas-tight integrity according to ASTM F 1052, Standard Test Method for Pressure Testing Vapor Protective Ensembles. --- Inflation testing equipment should work with the selected NFPA 1994 Class 1 ensemble.	72
SCBA, CBRN	01C1-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. --- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA →	44,46,51, 54,82,85, 90

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C1 - NFPA 1994 Class 1 Ensembles 02 - Related Elements - Continued			
SCBA, CBRN - Continued		Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01C1-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01C1-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
Suit, Training	01C1-02-TRST Training suit based on similar design, but different materials as Item 01C1-01-ENSM.	Encapsulating suit that is constructed in similar manner as NFPA 1994, Class 1 ensemble. Suit uses different materials but similar design. Suits will not have same level of integrity or material performance as NFPA 1994, Class 1 ensemble. --- Training suits must never be used in actual operations, and must be clearly marked by the user organization to prevent their misuse.	
C1 - NFPA 1994 Class 1 Ensembles 03 - Optional Elements			
Covers, Outer Footwear	01C1-03-FTWC Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. --- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	
Gloves, Inner, Cotton	01C1-03-GLIC Inner cotton gloves (no standard currently applies for this item).	Knit cotton gloves worn under ensemble gloves for increased comfort. Gloves may be one-piece or formed from multiple pieces. --- Gloves should fit intimately onto wearer's hands. Gloves must be 100% cotton and be relatively light weight to prevent loss of hand function when worn with other gloves.	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C1 - NFPA 1994 Class 1 Ensembles 03 - Optional Elements - Continued			
Gloves, Outer, Disposable	01C1-03-GLOD Outer disposable gloves for contamination protection (marked in accordance with ANSI/ISEA 105).	Gloves may use a variety of different materials, are provided in different lengths and sizes, and include other features such as grip finishes and cuff end designs. Typical outer disposable gloves for NFPA 1994 Class 1 ensembles are heavy rubber gloves that offer some additional permeation and physical hazard resistance. --- Unsupported gloves should be used which provide a performance level of 2 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Supported gloves should be avoided as fabric inserts will absorb chemicals. These gloves should also be free from holes as required in ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. If rugged physical environment is involved, work gloves should be used in lieu of disposable outer gloves. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
Gloves, Outer, Work	01C1-03-GLOW Outer work gloves for physical hazard protection (marked in accordance with ANSI/ISEA 105).	Outer work gloves are made of materials that provide a relatively high degree of physical hazard resistance. Gloves are available in a variety of materials, construction styles, and cuff styles. --- Work gloves should provide a performance level of 3 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
System, Personal Alert Safety (PASS)	01C1-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Undergarment, Non-Flame-Resistant	01C1-03-UNDR Non-flame-resistant undergarment for contamination control during doffing, and	Undergarment(s) worn underneath garments will generally be constructed of a non-flame-resistant material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). → ---	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C1 - NFPA 1994 Class 1 Ensembles 03 - Optional Elements - Continued			
Undergarment, Non-Flame-Resistant - Continued	comfort (no standard currently applies for this item).	The selected undergarment(s) should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01C1-03-UNFR Flame-resistant undergarment (certified as compliant with NFPA 2112 or the flame-resistant option of NFPA 1975).	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	82,88,99, 100
C2 - NFPA 1994 Class 2 Ensembles 01 - Required Elements			
Ensemble, Chemical/Biological Protective, NFPA 1994 Class 2	01C2-01-ENSM NFPA 1994 Class 2 Chemical/Biological Terrorism Protective Ensemble, including suit with attached gloves and footwear or booties with outer boots (certified as compliant with NFPA 1994).	Ensemble consists of an encapsulating suit, which may or may not be gas-tight, gloves, and footwear. The ensemble may be designed with the SCBA inside or outside of the ensemble. The ensemble is designed to minimize the inward leakage of gases or vapors as demonstrated by a specific test (leakage of no more than 2% is permitted). Materials are tested for permeation resistance to selected chemical agent and toxic industrial chemicals at low concentrations; materials are also tested for viral penetration resistance, and various physical properties with criteria at lower levels as compared to Class 1. Ensembles are tested for functionality. --- Class 2 ensembles are intended for circumstances where the agent or threat may be identified, when the actual release has subsided, or in an area where live victims may be rescued. Conditions of exposure include possible contact with residual vapor or gas and highly contaminated surfaces at the emergency scene. Most victims in the response area are alive and show signs of movement, but are non-ambulatory. For Class 2 ensembles, breathing air from the SCBA may still limit wearing time. However, Class 2 ensembles may also be configured with →	44,45, 82,96

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C2 - NFPA 1994 Class 2 Ensembles 01 - Required Elements - Continued			
Ensemble, Chemical/Biological Protective, NFPA 1994 Class 2 - Continued		powered air-purifying respirators that provide longer duration response time. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Footwear, Chemical/Biological Terrorism Protective, NFPA 1994 Class 2	01C2-01-FTWR Chemical/Biological Protective Footwear, NFPA 1994 Class 2 (certified as compliant with NFPA 1994).	Footwear may be attached to suits as part of an overall ensemble. Alternatively, the footwear system may consist of a bootie (sock-like extension of the suit) combined with an outer boot. The footwear system must resist inward leakage (2% is permitted) when tested as part of the overall ensemble. Materials are evaluated for permeation resistance against low levels of chemical agents, liquid toxic industrial chemicals, and gaseous toxic industrial chemicals. Footwear is further evaluated for physical properties (impact, abrasion, cut, puncture, cold temperature performance) and function (traction). ---------- Footwear of Class 2 ensembles is intended for circumstances where the agent or threat may be identified, when the actual release has subsided, or in an area where live victims may be rescued. Conditions of exposure include possible contact with residual vapor or gas and highly contaminated surfaces at the emergency scene. Most victims in the response area are alive and show signs of movement, but are non-ambulatory. For Class 2 ensembles, breathing air from the SCBA may still limit wearing time. However, Class 2 ensembles may also be configured with powered air-purifying respirators that provide longer duration response time. Only footwear certified with a particular ensemble may be worn with that ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,96
Gloves, Chemical/ Biological Terrorism Protective, NFPA 1994 Class 2	01C2-01-GLOV Chemical/Biological Protective Gloves, NFPA 1994 Class 2 (certified as compliant with NFPA 1994).	Gloves are attached to suits as part of an overall ensemble. The gloves may consist of one or more layers with a leak-free interface with the suit sleeve. Gloves are evaluated as part of the ensemble for inward leakage (2% is permitted). Materials are evaluated for permeation resistance against low levels of chemical agents, liquid toxic industrial chemicals, and gaseous toxic industrial chemicals. Gloves are further evaluated for physical properties (cut, puncture, cold temperature performance) and function (dexterity). ---------- Gloves of Class 2 ensembles are intended for circumstances where the agent or threat may be identified, when the actual release has subsided, or in an area where live victims may be rescued. Conditions of exposure include possible contact with residual vapor or gas and highly contaminated surfaces at the emergency scene. Most victims in the response area are alive →	44,45, 82,96

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C2 - NFPA 1994 Class 2 Ensembles 01 - Required Elements - Continued			
Gloves, Chemical/ Biological Terrorism Protective, NFPA 1994 Class 2 - Continued		and show signs of movement, but are non-ambulatory. For Class 2 ensembles, breathing air from the SCBA may still limit wearing time. However, Class 2 ensembles may also be configured with powered air-purifying respirators that provide longer duration response time. Only gloves certified with a particular ensemble may be worn with that ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
C2 - NFPA 1994 Class 2 Ensembles 02 Related Elements			
Hardhat	01C2-02-HHAT Hardhat (certified as compliant to ANSI 89.1)	Hardhat consists of shell with suspension; the suspension generally consists of a chin strap or nape strap (worn behind the head) or both. Some hardhats may contain padding for additional impact protection. --- Minimum hardhat should be a Class G (general). Hardhat is worn inside encapsulating suit for head protection. Selected suit must accommodate hardhat; the hardhat should not interfere with head movement or wearing of SCBA. Use of head protection should be in accordance with OSHA 29 CFR 1910.135.	47,67
SCBA, CBRN	01C2-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. --- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not →	44,46,51, 54,82,85, 90

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C2 - NFPA 1994 Class 2 Ensembles 02 Related Elements - Continued			
SCBA, CBRN - Continued		be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01C2-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01C2-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
Suit, Training	01C2-02-TRST Training suit based on similar design, but different materials as Item 01C2-01-ENSM.	Encapsulating or non-encapsulating suit that is constructed in similar manner as NFPA 1994, Class 2 ensemble. Suit uses different materials but similar design. Suits will not have same level of integrity or material performance as NFPA 1994, Class 2 ensemble. --- Training suits must never be used in actual operations, and must be clearly marked by the user organization to prevent their misuse.	
C2 - NFPA 1994 Class 2 Ensembles 03 Optional Elements			
Covers, Outer Footwear	01C2-03-FTWC Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. --- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C2 - NFPA 1994 Class 2 Ensembles 03 Optional Elements - Continued			
Gloves, Inner, Cotton	01C2-03-GLIC Inner cotton gloves (no standard currently applies for this item).	Knit cotton gloves worn under ensemble gloves for increased comfort. Gloves may be one-piece or formed from multiple pieces. --- Gloves should fit intimately onto wearer's hands. Gloves must be 100% cotton and be relatively light weight to prevent loss of hand function when worn with other gloves.	
Gloves, Outer, Disposable	01C2-03-GLOD Outer disposable gloves for contamination protection (marked in accordance with ANSI/ISEA 105).	Gloves may use a variety of different materials, are provided in different lengths and sizes, and include other features such as grip finishes and cuff end designs. --- Unsupported gloves should be used which provide a performance level of 2 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Supported gloves should be avoided as fabric inserts will absorb chemicals. These gloves should also be free from holes as required in ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. If rugged physical environment is involved, work gloves should be used in lieu of disposable outer gloves. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
Gloves, Outer, Work	01C2-03-GLOW Outer work gloves for physical hazard protection (marked in accordance with ANSI/ISEA 105).	Outer work gloves are made of materials that provide a relatively high degree of physical hazard resistance. Gloves are available in a variety of materials, construction styles, and cuff styles. --- Work gloves should provide a performance level of 3 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
System, Personal Alert Safety (PASS)	01C2-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C2 - NFPA 1994 Class 2 Ensembles 03 Optional Elements - Continued			
Undergarment, Coverall, Disposable	01C2-03-UNCD Disposable coverall undergarment for contamination control (no standard currently applies for this item).	A disposable coverall worn underneath will generally be constructed of a non-woven material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). --- The selected coverall should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01C2-03-UNFR Flame-resistant undergarment (certified as compliant with NFPA 2112 or the flame-resistant option of NFPA 1975).	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	82,88,99, 100
C3 - NFPA 1994 Class 3 Ensembles 01 - Required Elements			
Ensemble, Chemical/Biological Protective, NFPA 1994 Class 3	01C3-01-ENSM NFPA 1994 Class 3 Chemical/Biological Terrorism Protective Ensemble, including suit or garment with attached or separate gloves and footwear or booties with outer boots (certified as compliant with NFPA 1994)	Ensemble consists of full body one- or multi-piece suit, gloves, and footwear. The ensemble may be designed for use with SCBA or APR, though APR is consistent with the use of this ensemble. The ensemble is designed to minimize the inward leakage of liquids only by use of a liquid-tight integrity test. The suit and component parts do not offer protection from gases, vapors, or aerosols. Materials are tested for permeation resistance to selected chemical agent and toxic industrial chemicals at very low concentrations; materials are also tested for viral penetration resistance, and various physical properties with criteria at lower levels as compared to Class 2. Ensembles are tested for functionality. --- Class 3 ensembles are intended for use long after the release has occurred, at relatively large distances from the point of release, or in the peripheral zone of the release scene for such functions as decontamination, patient care, crowd control, perimeter control, traffic control, →	44,45, 82,97

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 01 - Required Elements - Continued			
Ensemble, Chemical/Biological Protective, NFPA 1994 Class 3 - Continued		and clean-up. Class 3 ensembles should only be used when there is very little potential for vapor or gas exposure, when exposure to liquids is expected to be incidental through contact with contaminated surfaces, and when dealing with patients or self-evacuating victims. Class 3 ensembles must cover the individual and it is preferred that this clothing also cover the wearer's respirator to limit its potential for contamination. Because these ensembles are intended for longer wearing periods, the use of air-purifying respirators with these suits is likely. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Footwear, Chemical/Biological Protective, NFPA 1994 Class 3	01C3-01-FTWR NFPA 1994 Class 3 Chemical/Biological Terrorism Protective Footwear (certified as compliant with NFPA 1994).	Footwear may be attached to suits as part of an overall ensemble. Alternatively, the footwear system may consist of a bootie (sock-like extension of the suit) combined with an outer boot. The footwear system must resist inward leakage of liquid when tested separately and as part of the overall ensemble. Materials are evaluated for permeation resistance against very low levels of chemical agents and liquid toxic industrial chemicals. Footwear is further evaluated for physical properties (impact, abrasion, cut, puncture, cold temperature performance) and function (traction). --- Class 3 ensembles are intended for use long after the release has occurred, at relatively large distances from the point of release, or in the peripheral zone of the release scene for such functions as decontamination, patient care, crowd control, perimeter control, traffic control, and clean-up. Class 3 ensembles should only be used when there is very little potential for vapor or gas exposure, when exposure to liquids is expected to be incidental through contact with contaminated surfaces, and when dealing with patients or self-evacuating victims. Class 3 ensembles must cover the individual and it is preferred that this clothing also cover the wearer's respirator to limit its potential for contamination. Because these ensembles are intended for longer wearing periods, the use of air-purifying respirators with these suits is likely. Only footwear certified with a particular ensemble may be worn with that ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,97
Gloves, Chemical/ Biological Protective, NFPA 1994 Class 3	01C3-01-GLOV NFPA 1994 Class 3 Chemical/Biological Terrorism Protective	Gloves may or may not be attached to the suit as part of an overall ensemble. The gloves may consist of one or more layers with a leak-free interface with the suit sleeve. Gloves are evaluated separately and as part of the ensemble for inward leakage of liquids. Materials are evaluated for permeation resistance against very low levels of chemical agents, liquid toxic industrial chemicals, and gaseous toxic industrial chemicals. Gloves are further evaluated for physical properties (cut, puncture, cold temperature performance) and function (dexterity). →	44,45, 82,97

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 01 - Required Elements - Continued			
Gloves, Chemical/ Biological Protective, NFPA 1994 Class 3 - Continued	Gloves (certified as compliant with NFPA 1994).	---------- Class 3 ensembles are intended for use long after the release has occurred, at relatively large distances from the point of release, or in the peripheral zone of the release scene for such functions as decontamination, patient care, crowd control, perimeter control, traffic control, and clean-up. Class 3 ensembles should only be used when there is very little potential for vapor or gas exposure, when exposure to liquids is expected to be incidental through contact with contaminated surfaces, and when dealing with patients or self-evacuating victims. Class 3 ensembles must cover the individual and it is preferred that this clothing also cover the wearer's respirator to limit its potential for contamination. Because these ensembles are intended for longer wearing periods, the use of air-purifying respirators with these suits is likely. Only gloves certified with a particular ensemble may be worn with that ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
C3 - NFPA 1994 Class 3 Ensembles 02 - Related Elements			
Respirator, Air-Purifying, CBRN	01C3-02-APR CBRN Air-Purifying Respirator (APR) (certified by NIOSH as compliant with the CBRN approval criteria).	NIOSH has established specific criteria for air-purifying respirators (APRs) with CBRN approval. These criteria include existing tests established in 42 CFR Part 84, supplemented by additional tests for specific performance against selected chemicals and agents and other areas of performance. The APR must be a full facepiece. Each manufacturer will offer facepieces in different materials and different designs. ---------- NIOSH has listed the following limitations for CBRN APR: 1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. 5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. →	44, 46, 51,53

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 02 - Related Elements - Continued			
Respirator, Air-Purifying, CBRN - Continued		8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. 13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	
CBRN Canister or cartridges, APR	01C3-02-APRC Canisters for Item 01C3-02-APR	The canisters for APR with CBRN are of a single type designed to meet NIOSH approval criteria against 10 different industrial chemicals and 2 agents. The canisters must incorporate a P100 filter capability and use a special mounting thread that permits interchangeability of the canisters with other manufacturer respirators when no other canisters are available. --- NIOSH has listed the following limitations for CBRN APR: 1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. →	51,53

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 02 - Related Elements - Continued			
CBRN Canister or cartridges, APR - Continued		5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. 8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. 13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	
Hardhat	01C3-02-HHAT Hardhat (certified as compliant to ANSI 89.1)	Hardhat consists of shell with suspension; the suspension generally consists of a chin strap or nape strap (worn behind the head) or both. Some hardhats may contain padding for additional impact protection. --- Minimum hardhat should be a Class G (general). Hardhat is worn inside encapsulating suit for head protection. Selected suit must accommodate hardhat; the hardhat should not interfere with head movement or wearing of SCBA. Use of head protection should be in accordance with OSHA 29 CFR 1910.135.	47,67

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 02 - Related Elements - Continued			
Canister, PAPR	01C3-02-PAPC Canisters or Cartridges for Item 01C3-02-PAPR	Canisters are single filter/adsorbent elements used with a respirator; cartridges are dual filter/adsorbent elements. Canisters and cartridges are color-coded by the type of agents (chemicals) the canister or cartridge is rated against. Some canisters or cartridges may protect against multiple agents and chemicals. Some canisters and cartridges come with prefilters for particulates. --- Each canister or cartridge must have a NIOSH approval number. Canisters and cartridges are specific to the manufacturer's respirator and may not be interchanged with other respirators. Canisters and cartridges have a limited service life, which depends on the concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	46,51
Respirator, Powered, Air-Purifying	01C3-02-PAPR Respirator, Powered, Air-Purifying (PAPR) (certified by NIOSH as compliant with 42 CFR Part 84 and outfitted with a canister or cartridge appropriate to the response).	Powered air-purifying respirators (PAPRs) use a blower in combination with either a loose-fitting respirator inlet cover (such as a hood or helmet) or a facepiece. PAPRs may use different designs in hood, helmet, and facepiece designs. Generally, the blower is belt mounted, but other mounting options are available. The PAPR may use a single canister or multiple cartridges. --- Powered air-purifying respirators (PAPR) cannot be used in environments classified as immediately dangerous to life and health (IDLH) and further cannot be used when the oxygen concentration in the environment is less than 19.5%. PAPRs must be fitted with the appropriate canister or cartridges. The length of canister or cartridge use will depend on concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	46,51
Suit, Training	01C3-02-TRST Training suit based on similar design, but different materials as Item 01C3-01-ENSM.	Non-encapsulating suit that is constructed in a manner similar to a NFPA 1994, Class 3 suit. Suit uses different materials but similar design. Suits will not have same level of integrity or material performance as NFPA 1994, Class 3 ensemble. --- Training suits must never be used in actual operations, and must be clearly marked by the user organization to prevent their misuse.	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 03 - Optional Elements			
Covers, Outer Footwear	01C3-03-FTWO Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. --- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	
Gloves, Inner, Cotton	01C3-03-GLIC Inner cotton gloves (no standard currently applies for this item).	Knit cotton gloves worn under ensemble gloves for increased comfort. Gloves may be one-piece or formed from multiple pieces. --- Gloves should fit intimately onto wearer's hands. Gloves must be 100% cotton and be relatively light weight to prevent loss of hand function when worn with other gloves.	
Gloves, Outer, Disposable	01C3-03-GLOD Outer disposable gloves for contamination protection (marked in accordance with ANSI/ISEA 105).	Gloves may use a variety of different materials, are provided in different lengths and sizes, and include other features such as grip finishes and cuff end designs. --- Unsupported gloves should be used which provide a performance level of 2 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Supported gloves should be avoided as fabric inserts will absorb chemicals. These gloves should also be free from holes as required in ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. If rugged physical environment is involved, work gloves should be used in lieu of disposable outer gloves. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
Gloves, Outer, Work	01C3-03-GLOW Outer work gloves for physical hazard protection (marked in accordance with ANSI/ISEA 105).	Outer work gloves are made of materials that provide a relatively high degree of physical hazard resistance. Gloves are available in a variety of materials, construction styles, and cuff styles. --- Work gloves should provide a performance level of 3 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
System, Personal Alert Safety (PASS)	01C3-03-PASS PASS Device - Personal Alert Safety System	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme →	82,91

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
C3 - NFPA 1994 Class 3 Ensembles 03 - Optional Elements - Continued			
System, Personal Alert Safety (PASS) - Continued	(certified as compliant with NFPA 1982).	physical or environmental conditions. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	
Undergarment, Coverall, Disposable	01C3-03-UNCD Disposable coverall undergarment for contamination control (no standard currently applies for this item).	A disposable coverall worn underneath will generally be constructed of a non-woven material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). --- The selected coverall should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01C3-03-UNFR Flame-resistant undergarment (certified as compliant with NFPA 2112 or the flame-resistant option of NFPA 1975).	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	82,88,99, 100
EM - NFPA 1999 Protective Clothing (Emergency Medical Services) 01 - Required Elements			
Eye/Face Protection Devices, Emergency Medical, NFPA 1999	01EM-01-EYEP NFPA 1999 emergency medical eye and face protection devices (certified as compliant with NFPA 1999).	Eye and face protection devices can include splash-resistant eyewear such as faceshields or goggles, hooded visors, and masks. Only a few requirements exist for emergency medical face protection devices. These include permitting the wearer to pass a visual acuity test while wearing the device, passing a simulated spray test, and utilizing materials that do not allow viral penetration. → ---	43,45,82, 83,98

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
EM - NFPA 1999 Protective Clothing (Emergency Medical Services) 01 - Required Elements - Continued			
Eye/Face Protection Devices, Emergency Medical, NFPA 1999 - Continued		The selected eye and face protection device should provide protection to the face from direct impingement of blood or body fluids, or subsequent runoff. A combination of eye and face protection devices may be used to meet this level of protection. Eye and face protection devices are not respirators and will not protect against airborne pathogens. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	
Footwear Covers, Emergency Medical, NFPA 1999	01EM-01-FTWC NFPA 1999 emergency medical protective footwear covers (certified as compliant with NFPA 1999).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination, and consequently are disposable after use. Footwear covers compliant with NFPA 1999 meet all barrier requirements of NFPA 1999-compliant footwear, but rely on physical protection from inner footwear (such as impact and puncture protection). --- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top. NFPA 1999-compliant footwear covers may not protect against airborne pathogens. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	43,45,82, 83,98
Footwear, Emergency Medical, NFPA 1999	01EM-01-FTWR NFPA 1999 emergency medical protective footwear (certified as compliant with NFPA 1999).	NFPA 1999 footwear is likely to be leather footwear that incorporates a barrier as part of the lining system. The barrier layer must provide protection against bloodborne pathogens as demonstrated through a viral penetration resistance test. Footwear must be a minimum of 4 inches high (covering the ankle) and must have minimal toe impact protection and other physical protection features including cut and puncture resistance. --- NFPA 1999 footwear should be used whenever the potential for blood or body fluid contact exists. The interface between the footwear and the bottom of the pants or coverall should provide resistance to inward leakage of liquids. NFPA 1999-compliant footwear may not protect against airborne pathogens. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	43,45,82, 83,98

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
EM - NFPA 1999 Protective Clothing (Emergency Medical Services) 01 - Required Elements - Continued			
Garment, Emergency Medical, NFPA 1999	01EM-01-GARM NFPA 1999 emergency medical protective garment (certified as compliant with NFPA 1999)	Under NFPA 1999, garments may be either full body outfits such as coveralls or jacket/pants combinations, or partial body clothing such as smocks, aprons, or sleeve protectors. In either case, the area of the body covered by the garment must afford complete barrier protection. For example, a garment with barrier panels built into the front of the garment, but with non-barrier materials in the back, would be considered unacceptable per NFPA 1999. The standard stipulates that the garments may be either single-use or reusable; however, single-use garments must be labeled "For Single Use Only." The barrier layer must provide protection against blood-borne pathogens as demonstrated through a viral penetration resistance test. The overall garment composite must also be breathable for improved wearer comfort. --- NFPA 1999 garments should be used whenever the potential for blood or body fluid contact exists. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	43,45,82, 83,98
Gloves, Emergency Medical, Cleaning, NFPA 1999	01EM-01-GLCL NFPA 1999 emergency medical cleaning gloves (certified as compliant with NFPA 1999).	Cleaning gloves are relatively thick rubber gloves intended to protect responders' hands from potentially contaminated blood and body fluids with a relatively higher level of physical protection compared to standard examination gloves used in most emergency medical operations. Cleaning gloves must also resist permeation from common disinfectants. Cleaning gloves are likely to be constructed of natural rubber, nitrile rubber, or Neoprene. Glove length, cuff design, and grip finishes will vary with different manufacturer products. --- Cleaning gloves should not be lined as the linings may absorb hazardous liquids. Cleaning gloves will not provide protection against all "sharps" or other physical hazards commonly encountered in cleaning following an emergency medical operation. Some wearers may be subject to natural rubber latex allergies and should use synthetic gloves instead. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	43,45,82, 83,98
Gloves, Emergency Medical, Protective, NFPA 1999	01EM-01-GLMP NFPA 1999 emergency medical protective gloves (certified as compliant with NFPA 1999).	NFPA 1999-compliant gloves are standard medical examination gloves that have met specific design and performance criteria established in NFPA 1999. Many standard medical examination gloves fail to meet the more rigorous barrier and physical strength criteria established in NFPA 1999. Most gloves are constructed from natural rubber or nitrile rubber, although some additional polymers are available. These gloves are designed to provide intimate fit on the →	43,45,82, 83,98

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
EM - NFPA 1999 Protective Clothing (Emergency Medical Services) 01 - Required Elements - Continued			
Gloves, Emergency Medical, Protective, NFPA 1999 - Continued		hand and allow fine dexterity and a high degree of tactility. --- NFPA 1999 gloves should be used in all emergency medical operations unless response conditions dictate the use of cleaning gloves, work gloves, or other gloves with additional protection. NFPA 1999 gloves should be selected that afford the highest degree of tactility while still affording adequate protection. Some wearers may be subject to natural rubber latex allergies and should use synthetic gloves instead. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	
Gloves, Emergency Medical, Work, NFPA 1999	01EM-01-GLMW NFPA 1999 emergency medical work gloves (certified as compliant with NFPA 1999).	NFPA 1999-compliant work gloves combine a rugged shell (leather or synthetic fabric) with a lining that includes a barrier layer. The shell fabric provides resistance to physical hazards such as cutting, punctures, and abrasion. The barrier layer provides resistance to penetration by bloodborne pathogens as demonstrated in a viral penetration resistance test. --- Work gloves trade off ruggedness for dexterity and tactility. NFPA 1999-compliant work gloves are intended for emergency medical operations involving significant physical hazards where a high level of dexterity and tactility are not needed. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030; NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition; and NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition.	43,45,82, 83,98
LE - Tactical Law Enforcement Protective Equipment 01 - Ballistic Protection			
Armor, Body	01LE-01-ARMR Personal body armor intended to protect the torso and extremities against gunfire. Body armor is also referred to as a bullet-resistant vest. This type of personal	Protection up to .30 caliber/7.62mm threat rounds, to include armor piercing. --- Refer to NIJ Guide 100-98, Selection and Application Guide to Personal Body Armor for appropriate selection and use of body armor. 100% protection from ballistic threats in all circumstances is impossible. Body armor selection is, to some extent, a tradeoff between ballistic protection and wearability. The selection of appropriate threat levels is important to ensure that wearers have an adequate level of ballistic threat protection for the environment in which they operate. The NIJ standard identifies protection classifications as Type I, IIA, II, IIIA, →	101,102

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
LE - Tactical Law Enforcement Protective Equipment 01 - Ballistic Protection - Continued			
Armor, Body - Continued	protective equipment is required by personnel entering into any zone for immediate tactical operations.	III and IV. These protection classifications cover threats from hand guns to rifles, including armor piercing rounds. Manufacturer instructions related to the care of the outer shell vest (carrier) must be followed. Body armor that is not worn provides no protection.	
Boots, Protective, Tactical/Climbing	01LE-01-BOOT Boots for immediate tactical operations.	Boots should be selected to meet mission and special considerations such as weather, terrain, etc.	
Helmet, Ballistic	01LE-01-HLMT Ballistic helmet intended to protect the wearer against gunfire and fragmentation threats during tactical operations.	Ballistic helmets covered in this standard are classified into three levels of protective performance. --- Consider ability to attach visors, neck protection. Should accommodate full face respirator or SCBA facepieces, night vision devices, and communications equipment. Helmets should be inspected for dents, cracks, crazing, chipped or sharp corners, and other evidence of inferior workmanship. Requirements for face shields are not included in NIJ Standard 0106.01. A revision to this standard is currently underway. Riot Helmets and Face Shield performance requirements are covered in NIJ Standard 0104.02.	103,104
Shield, Ballistic	01LE-01-SHLD Ballistic shield intended to protect personnel against gunfire and fragmentation threats while conducting tactical operations.	Ballistic performance to threat level III-A Ambidextrous handle	105
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 01 - Required Elements			
Footwear, Structural Fire Fighting Protective, NFPA 1971	01SF-01-FTWR NFPA 1971 structural fire fighting protective footwear (certified as	Footwear may be either rubber or leather. Rubber boots use a step-in design, while leather boots can be either step-in or have a gusset with lace or zipper closure option. Other important footwear features include the lining package, type of outer sole, and pull-on loops or tabs. Footwear must include a protective toe cap and puncture resistant plate in the sole. Footwear comes in varying heights, but must be at least 8 inches high when measured from the inside. →	43,45,82, 84,87

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 01 - Required Elements - Continued			
Footwear, Structural Fire Fighting Protective, NFPA 1971 - Continued	compliant with NFPA 1971).	---------- Structural fire fighting includes rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation. While the primary intent of structural fire fighting protective clothing is to protect against high heat and incidental flame contact while providing adequate thermal insulation in a range of fireground conditions, structural fire fighting protective clothing is also designed to protect against some hazardous liquids, including blood and body fluids, and physical hazards. Nevertheless, structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. Footwear should be chosen to be compatible with selected garments such that a complete protective thermal and moisture envelope is provided for the firefighter. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, use, and maintenance requirements are provided in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles, 2001 Edition.	
Garment, Protective, Structural Fire Fighting, NFPA 1971	01SF-01-GARM NFPA 1971 structural fire fighting protective garment (certified as compliant with NFPA 1971).	Garments are available in a number of different designs and materials. Garments are generally designed as a coat and pants. The coat may be of standard length with waist high pants, or short with longer bib-style pants. Pants often include suspenders. Different types of closures are used on the front of coat and in the pants fly to provide overall liquid-tight integrity. Garments must include reflective trim for daytime and nighttime enhanced visibility. Garments are provided with a number of options in pocket placement, types of reinforcements, and other special features for improved wearing comfort and thermal insulation. The garment composite material consists of an outer shell, moisture barrier, and thermal barrier. The industry uses hundreds of combinations of these three layer to achieve different levels of thermal insulation as balanced against comfort and other performance properties. ---------- Structural fire fighting includes rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation. While the primary intent of structural fire fighting protective clothing is to protect against high heat and incidental flame contact while providing adequate thermal insulation in a range of fireground conditions, structural fire fighting protective clothing is also designed to protect against some hazardous liquids, including blood and body fluids, and physical hazards. Nevertheless, structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The garments should be fitted to the individual to provide complete protection in all wearer positions. Use considerations are →	43,45,82, 84,87

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 01 - Required Elements - Continued			
Garment, Protective, Structural Fire Fighting, NFPA 1971 - Continued		provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, use, and maintenance requirements are provided in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles, 2001 Edition.	
Gloves, Protective, Structural Fire Fighting, NFPA 1971	01SF-01-GLOV NFPA 1971 structural fire fighting protective gloves (certified as compliant with NFPA 1971).	Gloves consist of a shell and lining. Most glove shells are heat and flame resistant leather, although some gloves use textile materials. The lining may be separate or an integrated moisture barrier and thermal barrier. Moisture barriers may be coated fabrics or laminates that offer some degree of breatheability. Different construction methods are used to make gloves, including the way that the liner is inserted to stay within the glove. Gloves may have a gauntlet or a knit wristlet. --- Structural fire fighting includes rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation. While the primary intent of structural fire fighting protective clothing is to protect against high heat and incidental flame contact while providing adequate thermal insulation in a range of fireground conditions, structural fire fighting protective clothing is also designed to protect against some hazardous liquids, including blood and body fluids, and physical hazards. Nevertheless, structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The type of glove cuff is affected by the wristlet construction used on the protective coat. Gloves should be selected to be compatible with the coat sleeve. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, use, and maintenance requirements are provided in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles, 2001 Edition.	43,45,82, 84,87
Helmet, Protective, Structural Fire Fighting, NFPA 1971	01SF-01-HLMT NFPA 1971 structural fire fighting protective helmet (certified as compliant with NFPA 1971).	Helmets are required to include the minimum components of a shell; an energy absorption system; a retention system; reflective trim; ear covers; and a faceshield, goggles or both. The majority of performance requirements are applied to the complete helmet, including tests for impact/acceleration, physical penetration, heat resistance, flame resistance, electrical resistance, and retention/suspension system performance. Other requirements are applied to individual components, such as the textiles used in ear covers. Differences in helmets relate to the shell material, type of suspension (including the method of size adjustment) and use of an impact cap. Helmets are available in a range of weights and styling (including traditional and modern styles). →	43,45,82, 84,87

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 01 - Required Elements - Continued			
Helmet, Protective, Structural Fire Fighting, NFPA 1971 - Continued		---------- Structural fire fighting includes rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation. While the primary intent of structural fire fighting protective clothing is to protect against high heat and incidental flame contact while providing adequate thermal insulation in a range of fireground conditions, structural fire fighting protective clothing is also designed to protect against some hazardous liquids, including blood and body fluids, and physical hazards. Nevertheless, structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. NFPA 1971 permits the use of goggles in place of or supplemental to the helmet faceshield. However, the type of goggles required by the standard must meet a number of requirements that go beyond the specific performance of primary eye protection in the ANSI Z87.1 standard. NFPA 1971 requires that in order for goggles to be part of the helmet, sample goggles must meet test requirements for oven heat resistance, impact resistance, flame resistance and scratch resistance. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, use, and maintenance requirements are provided in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles, 2001 Edition.	
Hood, Protective, Structural Fire Fighting, NFPA 1971	01SF-01-HOOD NFPA 1971 structural fire fighting protective hood (certified as compliant with NFPA 1971).	The hood is a knit, pull-over clothing interface item intended to protect the wearer's head, face, and neck in areas not protected by the helmet, coat collar, and SCBA facepiece. The hood is designed with a face opening to accommodate the SCBA facepiece and a bib such that the hood stays tucked in under the coat collar when in use. Hoods may be made of different flame and heat resistant materials and may be in single or double layers. Some hoods include a ventilated layer at the top (underneath the helmet) which provides additional comfort for heat loss from the wearer. ---------- Structural fire fighting includes rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation. While the primary intent of structural fire fighting protective clothing is to protect against high heat and incidental flame contact while providing adequate thermal insulation in a range of fireground conditions, structural fire fighting protective clothing is also designed to protect against some hazardous liquids, including blood and body fluids, and physical hazards. Nevertheless, structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The hood should be selected to be compatible with the coat and other elements of the structural fire fighting protective →	43,45,82, 84,87

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 01 - Required Elements - Continued			
		ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.132 and 1910.1030, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, use, and maintenance requirements are provided in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles, 2001 Edition.	
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 02 - Related Elements			
SCBA, CBRN	01SF-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. ---------- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	44,46,51, 54,82,85, 90

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 02 - Related Elements - Continued			
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01SF-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01SF-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
SF - NFPA 1971 Ensembles (Structural Fire Fighting) 03 - Optional Elements			
System, Personal Alert Safety (PASS)	01SF-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Undergarment, Flame-Resistant	01SF-03-UNFR Flame-resistant under-garment (certified as compliant with the optional flame-resistant requirements of NFPA 1975).	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,88
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 01 - Required Items			
Footwear, Protective, Proximity Fire Fighting, NFPA 1976	01SH-01-FTWR Structural fire fighting protective footwear	Proximity fire fighting protective footwear is similar to footwear used for structural fire fighting, except that the footwear materials are designed to offer higher levels of radiant heat protection. --- Proximity fire fighting is a specialized fire fighting operation that can include the activities of →	45,82,89

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 01 - Required Items - Continued			
Footwear, Protective, Proximity Fire Fighting, NFPA 1976 - Continued	(certified as compliant with NFPA 1976).	rescue, fire suppression, and property conservation at incidents involving fires producing high levels of radiant, conductive, and convective heat. Specialized thermal protection is necessary for persons involved in such operations due to the scope of these operations and the proximity to the fire (although direct entry into flame is NOT made). These operations usually are exterior operations, but may be combined with interior operations. Proximity fire fighting is not structural fire fighting but may be combined with structural fire-fighting operations. Proximity fire fighting also is not entry fire fighting. Structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. Footwear should be chosen to be compatible with selected garments such that a complete protective thermal and moisture envelope is provided for the firefighter. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Garment, Protective, Proximity Fire Fighting, NFPA 1976	01SH-01-GARM Structural fire fighting protective garment (certified as compliant with NFPA 1976).	Proximity fire fighting protective garments are similar to garments used for structural fire fighting, except that the garment materials are designed to offer higher levels of radiant heat protection. This is accomplished by the use of an aluminized fabric outer shell in place of the conventional textile-based outer shells used for structural fire fighting protective clothing. The aluminized outer shell is evaluated for a number of properties to demonstrate high heat resistance and durability of the reflective surface. Proximity fire fighting protective clothing also does not incorporate trim and other non-reflective materials on the shell outer surface. ---------- Proximity fire fighting is a specialized fire fighting operation that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing high levels of radiant, conductive, and convective heat. Specialized thermal protection is necessary for persons involved in such operations due to the scope of these operations and the proximity to the fire (although direct entry into flame is NOT made). These operations usually are exterior operations, but may be combined with interior operations. Proximity fire fighting is not structural fire fighting but may be combined with structural fire-fighting operations. Proximity fire fighting also is not entry fire fighting. Structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The garments should be fit to the individual to provide complete protection in all wearer positions. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,89

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 01 - Required Items - Continued			
Gloves, Protective, Proximity Fire Fighting, NFPA 1976	01SH-01-GLOV Structural fire fighting protective gloves (certified as compliant with NFPA 1976).	Proximity fire fighting protective gloves are similar to gloves used for structural fire fighting, except that the gloves materials are designed to offer higher levels of radiant heat protection. Gloves are required to have a highly reflective (aluminized) surface on the back of the hand. The palm is generally leather. Different glove designs are used to achieve this level of performance. Additional lining materials may be included for increased radiant heat insulation. --- Proximity fire fighting is a specialized fire fighting operation that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing high levels of radiant, conductive, and convective heat. Specialized thermal protection is necessary for persons involved in such operations due to the scope of these operations and the proximity to the fire (although direct entry into flame is NOT made). These operations usually are exterior operations, but may be combined with interior operations. Proximity fire fighting is not structural fire fighting but may be combined with structural fire-fighting operations. Proximity fire fighting also is not entry fire fighting. Structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The type of glove cuff is affected by the wristlet construction used on the protective coat. Gloves should be selected to be compatible with the coat sleeve. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,89
Helmet, Protective, Proximity Fire Fighting, NFPA 1976	01SH-01-HLMT Structural fire fighting protective helmet (certified as compliant with NFPA 1976).	Proximity fire fighting protective helmets are generally structural fire fighting protective helmets that incorporate an aluminized outer shell cover. Proximity helmets may also use a Gold Mylar face shield that also affords protection from radiant heat to the face area. --- Proximity fire fighting is a specialized fire fighting operation that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing high levels of radiant, conductive, and convective heat. Specialized thermal protection is necessary for persons involved in such operations due to the scope of these operations and the proximity to the fire (although direct entry into flame is NOT made). These operations usually are exterior operations, but may be combined with interior operations. Proximity fire fighting is not structural fire fighting but may be combined with structural fire-fighting operations. Proximity fire fighting also is not entry fire fighting. Structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,89

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 01 - Required Items - Continued			
Shroud, Protective, Proximity Fire Fighting, NFPA 1976	01SH-01-SHRD Structural fire fighting protective shroud (certified as compliant with NFPA 1976).	A proximity protective fire fighting shroud is an protective interface component that extends from the helmet to provide protection to the face and neck area not protected by other items. The shroud is constructed of the same three-layer construction provided in the clothing to offer a similar level of radiant heat protection. --- Proximity fire fighting is a specialized fire fighting operation that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing high levels of radiant, conductive, and convective heat. Specialized thermal protection is necessary for persons involved in such operations due to the scope of these operations and the proximity to the fire (although direct entry into flame is NOT made). These operations usually are exterior operations, but may be combined with interior operations. Proximity fire fighting is not structural fire fighting but may be combined with structural fire-fighting operations. Proximity fire fighting also is not entry fire fighting. Structural fire fighting protective clothing does not protect against chemical agents or toxic industrial chemicals. The shroud should be selected to be compatible with the helmet, coat and other elements of the structural fire fighting protective ensemble. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,89
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 02 - Related Items			
SCBA, CBRN	01SH-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. --- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated →	44,46,51, 54,82,85, 90

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 02 - Related Items - Continued			
SCBA, CBRN - Continued		with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01SH-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01SH-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 03 - Optional Items			
System, Personal Alert Safety (PASS)	01SH-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Cover, SCBA, Protective Radiant Heat	01SH-03-SCBH Protective radiant heat cover, SCBA.	Some manufacturers of proximity protective clothing or SCBA provide a protective cover to protect the SCBA from high levels of radiant heat. In general, aluminized fabrics are used as cover materials and configured for specific SCBA. The aluminized fabric material should meet →	89

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SH - NFPA 1976 Ensembles (Structural Fire Fighting, High Radiant Heat) 03 - Optional Items - Continued			
Cover, SCBA, Protective Radiant Heat - Continued		the same requirements as the garment outer shell as specified in NFPA 1976, Standard on Protective Ensemble for Proximity Fire Fighting. --- The cover should be specific for the type of SCBA being worn.	
Undergarment, Flame-Resistant	01SH-03-UNFR Flame-resistant under-garment (meeting the optional flame resistant requirements of NFPA 1975)	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,88
SP - NFPA 1992 Splash-Protective Ensembles and Items 01 - Liquid Splash-Protective Ensemble			
Ensemble, Liquid Splash-Protective, Encapsulating, NFPA 1992	01SP-01-ENCP Encapsulating liquid-splash protective ensemble (certified as compliant to NFPA 1992).	Liquid splash ensembles consist of a full-body garment, gloves, and footwear. The liquid splash-protective ensemble is either an encapsulating or non-encapsulating ensemble. Encapsulating ensembles enclose the wearer and his or her breathing apparatus; for non-encapsulating ensembles, the face area of the garment is open but the breathing apparatus covers the wearer's face. Both types of ensembles are evaluated with all components in place (garments, gloves, and footwear) for functionality and liquid-tight integrity. Different design features include the types of interfaces between gloves and footwear, and the type of closure. Liquid splash ensembles incorporate different materials for garments, gloves, and footwear. Some garment materials may be breathable, but still resist penetration by liquids. --- NFPA 1992 addresses the second tier of hazardous materials response protection. NFPA 1992-compliant ensembles and clothing items replace Level B protection. This standard establishes the requirements for chemical liquid splash protection where the chemical vapors that exist during a hazardous material response are no longer a hazard. The liquid splash-protective ensembles are intended for situations where the primary form of chemical exposure is short-term intermittent contact with liquid chemicals that do not produce skin-toxic or carcinogenic vapors. NFPA 1992 further permits the individual certification of garments, gloves, and foot- →	44,45, 82,94

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 01 - Liquid Splash-Protective Ensemble - Continued			
Ensemble, Liquid Splash-Protective, Encapsulating, NFPA 1992 - Continued		wear, which may not be part of an overall ensemble. The primary purpose of NFPA 1992 is to establish requirements for clothing that keeps liquids from contacting the wearer's skin. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Ensemble, Liquid Splash-Protective, Non-Encapsulating, NFPA 1992	01SP-01-NECP Non-encapsulating liquid-splash protective ensemble (certified as compliant to NFPA 1992).	Liquid splash ensembles consist of a full-body garment, gloves, and footwear. The liquid splash-protective ensemble is either an encapsulating or non-encapsulating ensemble. Encapsulating ensembles enclose the wearer and his or her breathing apparatus; for non-encapsulating ensembles, the face area of the garment is open but the breathing apparatus covers the wearer's face. Both types of ensembles are evaluated with all components in place (garments, gloves, and footwear) for functionality and liquid-tight integrity. Different design features include the types of interfaces between gloves and footwear, and the type of closure. Liquid splash ensembles incorporate different materials for garments, gloves, and footwear. Some garment materials may be breathable, but still resist penetration by liquids. ---------- NFPA 1992 addresses the second tier of hazardous materials response protection. NFPA 1992-compliant ensembles and clothing items replace Level B protection. This standard establishes the requirements for chemical liquid splash protection where the chemical vapors that exist during a hazardous material response are no longer a hazard. The liquid splash-protective ensembles are intended for situations where the primary form of chemical exposure is short-term intermittent contact with liquid chemicals that do not produce skin-toxic or carcinogenic vapors. NFPA 1992 further permits the individual certification of garments, gloves, and footwear, which may not be part of an overall ensemble. The primary purpose of NFPA 1992 is to establish requirements for clothing that keeps liquids from contacting the wearer's skin. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,94
SP - NFPA 1992 Splash-Protective Ensembles and Items 02 - Liquid Splash-Protective Clothing			
Footwear, Liquid Splash-Protective, NFPA 1992	01SP-02-FTWR Liquid-splash protective footwear (certified as compliant to NFPA 1992).	Footwear is an item of clothing or an element of the protective ensemble designed to provide minimum protection to the foot, ankle, and lower leg. Footwear includes boots or outer boots in conjunction with booties. Boots may use different rubber materials and may or may not include a liner. Footwear must be liquid-tight and provide physical hazard resistance against toe impact, cut, puncture, and abrasion. Soles must provide adequate traction. →	44,45, 82,94

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 02 - Liquid Splash-Protective Clothing - Continued			
Footwear, Liquid Splash-Protective, NFPA 1992 - Continued		---------- NFPA 1992 addresses the second tier of hazardous materials response protection. NFPA 1992-compliant ensembles and clothing items replace Level B protection. This standard establishes the requirements for chemical liquid splash protection where the chemical vapors that exist during a hazardous material response are no longer a hazard. The liquid splash-protective ensembles are intended for situations where the primary form of chemical exposure is short-term intermittent contact with liquid chemicals that do not produce skin-toxic or carcinogenic vapors. NFPA 1992 further permits the individual certification of garments, gloves, and footwear, which may not be part of an overall ensemble. The primary purpose of NFPA 1992 is to establish requirements for clothing that keeps liquids from contacting the wearer's skin. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Gloves, Liquid Splash-Protective, NFPA 1992	01SP-02-GLOV Liquid splash-protective gloves (certified as compliant to NFPA 1992).	Gloves are an element of the liquid splash-protective ensemble or an item of protective clothing designed to provide protection to the hands and wrists. Gloves are generally either supported or unsupported styles with different cuff design and grip finishes. Glove materials must demonstrate resistance to liquid chemical penetration, physical hazard resistance, and adequate hand function (dexterity). ---------- NFPA 1992 addresses the second tier of hazardous materials response protection. NFPA 1992-compliant ensembles and clothing items replace Level B protection. This standard establishes the requirements for chemical liquid splash protection where the chemical vapors that exist during a hazardous material response are no longer a hazard. The liquid splash-protective ensembles are intended for situations where the primary form of chemical exposure is short-term intermittent contact with liquid chemicals that do not produce skin-toxic or carcinogenic vapors. NFPA 1992 further permits the individual certification of garments, gloves, and footwear, which may not be part of an overall ensemble. The primary purpose of NFPA 1992 is to establish requirements for clothing that keeps liquids from contacting the wearer's skin. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,94

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 02 - Liquid Splash-Protective Clothing - Continued			
Garment, Liquid Splash-Protective, NFPA 1992	01SP-02-GRMT Liquid splash-protective garment (certified as compliant to NFPA 1992).	A garment is an element of the liquid splash-protective ensemble or an item of protective clothing designed to provide protection to the upper and lower torso, arms and legs (excluding the head, hands, and feet when garment hoods, gloves, and footwear are not provided). Garments include one or multi-piece splash suits, coveralls, and encapsulating suits. NFPA 1992 further permits both full body and partial body garments. Different design features include the types of interfaces between gloves and footwear, and the type of closure. Liquid splash ensembles incorporate different materials which may be coated or special laminates. Some garment materials may be breathable, but still resist penetration by liquids. --- NFPA 1992 addresses the second tier of hazardous materials response protection. NFPA 1992-compliant ensembles and clothing items replace Level B protection. This standard establishes the requirements for chemical liquid splash protection where the chemical vapors that exist during a hazardous material response are no longer a hazard. The liquid splash-protective ensembles are intended for situations where the primary form of chemical exposure is short-term intermittent contact with liquid chemicals that do not produce skin-toxic or carcinogenic vapors. NFPA 1992 further permits the individual certification of garments, gloves, and footwear, which may not be part of an overall ensemble. The primary purpose of NFPA 1992 is to establish requirements for clothing that keeps liquids from contacting the wearer's skin. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,94
SP - NFPA 1992 Splash-Protective Ensembles and Items 03 - Optional Respiratory Protection Equipment			
Respirator, Air-Purifying, CBRN	01SP-03-APR CBRN Air-Purifying Respirator (APR) (certified by NIOSH as compliant with the CBRN approval criteria).	NIOSH has established specific criteria for air-purifying respirators (APRs) with CBRN approval. These criteria include existing tests established in 42 CFR Part 84, supplemented by additional tests for specific performance against selected chemicals and agents and other areas of performance. The APR must be a full facepiece. Each manufacturer will offer facepieces in different materials and different designs. --- NIOSH has listed the following limitations for CBRN APR: 1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life →	46,51,53

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 03 - Optional Respiratory Protection Equipment - Continued			
Respirator, Air-Purifying, CBRN - Continued		Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. 5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. 8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. 13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	
CBRN Canister or cartridges, APR	01SP-03-APRC Canisters or Cartridges for Item 01SP-03-APR	The canister or cartridges for APR with CBRN are of a single type designed to meet NIOSH approval criteria against 10 different industrial chemicals and 2 agents. The canister or cartridge must incorporate a P100 filter capability and use a special mounting thread that permits interchangeability of the cartridge with other manufacturer respirators when no other cartridges are available. --- NIOSH has listed the following limitations for CBRN APR: →	51,53

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 03 - Optional Respiratory Protection Equipment - Continued			
CBRN Canister or cartridges, APR - Continued		1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. 5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. 8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. 13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 03 - Optional Respiratory Protection Equipment - Continued			
Canister, PAPR	01SP-03-PAPC Canisters or Cartridges for Item 01SP-03-PAPR	Canisters are single filter/adsorbent elements used with a respirator; cartridges are dual filter/adsorbent elements. Canisters and cartridges are color-coded by the type of agents (chemicals) the canister or cartridge is rated against. Some canisters or cartridges may protect against multiple agents and chemicals. Some canisters and cartridges come with prefilters for particulates. --- Each canister or cartridge must have a NIOSH approval number. Canisters and cartridges are specific to the manufacturer's respirator and may not be interchanged with other respirators. Canisters and cartridges have a limited service life, which depends on the concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	46,51
Respirator, Powered, Air-Purifying	01SP-03-PAPR Respirator, Powered, Air-Purifying (PAPR) (certified by NIOSH as compliant with 42 CFR Part 84 and outfitted with a canister or cartridge appropriate to the response).	Powered air-purifying respirators (PAPRs) use a blower in combination with either a loose-fitting respirator inlet cover (such as a hood or helmet) or a facepiece. PAPRs may use different designs in hood, helmet, and facepiece designs. Generally, the blower is belt mounted, but other mounting options are available. The PAPR may use a single canister or multiple cartridges. --- Powered air-purifying respirators (PAPR) cannot be used in environments classified as immediately dangerous to life and health (IDLH) and further cannot be used when the oxygen concentration in the environment is less than 19.5%. PAPRs must be fitted with the appropriate canister or cartridges. The length of canister or cartridge use will depend on concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	46,51
SCBA, CBRN	01SP-03-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. --- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would →	44,46,51, 54,82,85, 90

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
SP - NFPA 1992 Splash-Protective Ensembles and Items 03 - Optional Respiratory Protection Equipment - Continued			
SCBA, CBRN - Continued	the CBRN approval criteria.	occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01SP-03-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01C1-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
US - NFPA 1951 Ensembles (Urban Search and Rescue) 01 - Required Elements			
Eye/Face Protection, SAR Operations, NFPA 1951	01US-01-EYEP NFPA 1951 USAR Operations eye/face protection (certified as compliant with NFPA 1951).	The intended eye and face protection devices in NFPA 1951 are goggles that meet the requirements in ANSI Z87.1, American National Standard for Occupational and Educational Eye Protection, as well as additional heat and flame resistance requirements provided in NFPA 1951. Goggles may be ventilated or not ventilated. Ventilated goggles may offer either direct or indirect ventilation. The ventilation feature is intended to prevent fogging, but may allow particulate and other substances to enter inside the goggles. Straps are generally adjustable to fit different head sizes. Other types of devices that protect the eye may also be used if all of the requirements of NFPA 1951 are met. --- NFPA 1951 covers protective clothing and equipment used in urban technical rescue →	45,66,82, 86

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 01 - Required Elements - Continued			
Eye/Face Protection, SAR Operations, NFPA 1951 - Continued		incidents that include victim search, rescue, body recovery, and site stabilization during operations, such as building/structural collapse, vehicle/person extrication, confined space entry, trench/cave-in rescue, and rope rescue. NFPA 1951 does not address personal protective equipment for wilderness or other non-urban settings. Goggles are principally used in environments where primary eye protection is needed, including but not limited to those where flying debris and particulate may exist. Goggles are not needed if primary eye protection is provided by the full facepiece of a respirator. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Footwear, Protective, USAR Operations, NFPA 1951	01US-01-FTWR NFPA 1951 USAR Operations protective footwear (certified as compliant with NFPA 1951).	Footwear varies in the type of upper, lining, and sole materials. Footwear may be step in or use a combination of zippers, eyelets, and stud hooks with laces. Footwear complying with NFPA 1951 must incorporate a barrier material to prevent the inward leakage of liquids, such as emergency scene chemicals and blood or body fluids. Footwear materials must resist puncture, cut, and abrasion physical hazards. Overall footwear must provide toe impact protection, sole puncture and abrasion protection, and overall traction. --- NFPA 1951 covers protective clothing and equipment used in urban technical rescue incidents that include victim search, rescue, body recovery, and site stabilization during operations, such as building/structural collapse, vehicle/person extrication, confined space entry, trench/cave-in rescue, and rope rescue. NFPA 1951 does not address personal protective equipment for wilderness or other non-urban settings. Footwear must specifically be rugged and light weight for long-term wearing applications. Structural fire fighting footwear is typically too heavy for most operations covered by NFPA 1951. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,86
Garment, Protective, USAR Operations, NFPA 1951	01US-01-GARM NFPA 1951 USAR Operations protective garment (certified as compliant with NFPA 1951).	Garments must cover the entire body through the combination of a coat and pants, or coverall. Garment design features will vary with the manufacturer, including the type of closure, reinforcements and pockets. NFPA 1951 requires that garments use reflective trim for high visibility purposes. Garment materials may be one or two layers. Two-layer clothing consists of a shell fabric and lining. Shell fabrics must be flame and heat resistant in addition to being durable and resistant to physical hazards. The lining is a barrier material which is evaluated for liquid chemical and viral penetration resistance. The overall composite must afford a high level of breatheability for long-term wearing comfort. The overall garment must provide also provide integrity against liquid penetration. →	45,82,86

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 01 - Required Elements - Continued			
Garment, Protective, USAR Operations, NFPA 1951 - Continued		---------- NFPA 1951 covers protective clothing and equipment used in urban technical rescue incidents that include victim search, rescue, body recovery, and site stabilization during operations, such as building/structural collapse, vehicle/person extrication, confined space entry, trench/cave-in rescue, and rope rescue. NFPA 1951 does not address personal protective equipment for wilderness or other non-urban settings. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Gloves, Protective, USAR Operations, NFPA 1951	01US-01-GLOV NFPA 1951 USAR Operations protective gloves (certified as compliant with NFPA 1951).	NFPA 1951-compliant gloves have a rugged exterior and a liner that includes a barrier layer. The gloves are designed to protect against physical hazards, penetration of liquids, and flame and heat contact; however, the gloves offer only limited insulation against high heat sources. Gloves may use a variety of different construction techniques and materials. ---------- NFPA 1951 covers protective clothing and equipment used in urban technical rescue incidents that include victim search, rescue, body recovery, and site stabilization during operations, such as building/structural collapse, vehicle/person extrication, confined space entry, trench/cave-in rescue, and rope rescue. NFPA 1951 does not address personal protective equipment for wilderness or other non-urban settings. Gloves should be selected to provide a balance of physical, liquid, and heat protection versus hand function for dexterity, grip, and tactility. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,86
Helmet, Protective, USAR Operations, NFPA 1951	01US-01-HLMT NFPA 1951 USAR Operations protective helmet (certified as compliant with NFPA 1951).	Helmets consist of a shell and a suspension system. Helmets may be either hat type with a full brim, or cap style with no brim. The suspension system uses both a chin strap and a nape device that fits to the back of the head. Helmets may use different shell materials and may or may not include padding. Helmets are evaluated for physical protection (impact and penetration), heat and flame protection, and electrical protection. ---------- NFPA 1951 covers protective clothing and equipment used in urban technical rescue incidents that include victim search, rescue, body recovery, and site stabilization during operations, such as building/structural collapse, vehicle/person extrication, confined space entry, trench/cave-in rescue, and rope rescue. NFPA 1951 does not address personal protective equipment for wilderness or other non-urban settings. Use considerations are provided in OSHA Title 29 CFR Section 1910.132 and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	45,82,86

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 02 - Related Elements			
Respirator, Air-Purifying, CBRN	01US-02-APR CBRN Air-Purifying Respirator (APR) (certified by NIOSH as compliant with the CBRN approval criteria).	NIOSH has established specific criteria for air-purifying respirators (APRs) with CBRN approval. These criteria include existing tests established in 42 CFR Part 84, supplemented by additional tests for specific performance against selected chemicals and agents and other areas of performance. The APR must be a full facepiece. Each manufacturer will offer facepieces in different materials and different designs. --- NIOSH has listed the following limitations for CBRN APR: 1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. 5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. 8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. 13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, →	46,51,53

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 02 - Related Elements - Continued			
Respirator, Air-Purifying, CBRN - Continued		dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	
CBRN Canister or cartridges, APR	01US-02-APRC Canisters or Cartridges for Item 01US-02-APR	The canister or cartridges for APR with CBRN are of a single type designed to meet NIOSH approval criteria against 10 different industrial chemicals and 2 agents. The canister or cartridge must incorporate a P100 filter capability and use a special mounting thread that permits interchangeability of the cartridge with other manufacturer respirators when no other cartridges are available. --- NIOSH has listed the following limitations for CBRN APR: 1. Not for use in atmospheres containing less than 19.5 percent oxygen. 2. Not for use in atmospheres immediately dangerous to life and health or where hazards have not been fully characterized. 3. When used at defined occupational exposure limits, the rated service time cannot be exceeded. Follow established canister change schedules or observe End of Service Life Indicators to ensure that canisters are replaced before breakthrough occurs. 4. Failure to properly use and maintain this product could result in injury or death. 5. Follow the manufacturer's User Instructions for changing canisters. 6. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 7. Use replacement parts in the configuration as specified by the applicable regulations and guidance. 8. Refer to User Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 9. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 10. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. Procedures for monitoring radiation exposure and full radiation protection must be followed. 11. If during use an unexpected hazard is encountered such as a secondary CBRN device, pockets of entrapped hazard or any unforeseen hazard, immediately leave the area for clean air. 12. Use in conjunction with personal protective ensembles that provide appropriate levels of protection against dermal hazard. Failure to do so may result in personal injury even when the respirator is properly fitted, used, and maintained. →	51,53

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 02 - Related Elements - Continued			
CBRN Canister or cartridges, APR - Continued		13. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 14. Direct contact with CBRN agents requires proper handling of the respirator after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the respirator after decontamination. 15. The respirator should not be used beyond eight (8) hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. If liquid exposure is encountered, the respirator should not be used for more than two (2) hours.	
Canister, PAPR	01US-02-PAPC Canisters or Cartridges for Item 01US-02-PAPR	Canisters are single filter/adsorbent elements used with a respirator; cartridges are dual filter/adsorbent elements. Canisters and cartridges are color-coded by the type of agents (chemicals) the canister or cartridge is rated against. Some canisters or cartridges may protect against multiple agents and chemicals. Some canisters and cartridges come with prefilters for particulates. --- Each canister or cartridge must have a NIOSH approval number. Canisters and cartridges are specific to the manufacturer's respirator and may not be interchanged with other respirators. Canisters and cartridges have a limited service life, which depends on the concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	46,51
Respirator, Powered, Air-Purifying	01US-02-PAPR Respirator, Powered, Air-Purifying (PAPR) (certified by NIOSH as compliant with 42 CFR Part 84 and outfitted with a canister or cartridge appropriate to the response).	Powered air-purifying respirators (PAPRs) use a blower in combination with either a loose-fitting respirator inlet cover (such as a hood or helmet) or a facepiece. PAPRs may use different designs in hood, helmet, and facepiece designs. Generally, the blower is belt mounted, but other mounting options are available. The PAPR may use a single canister or multiple cartridges. --- Powered air-purifying respirators (PAPR) cannot be used in environments classified as immediately dangerous to life and health (IDLH) and further cannot be used when the oxygen concentration in the environment is less than 19.5%. PAPRs must be fitted with the appropriate canister or cartridges. The length of canister or cartridge use will depend on concentration of the chemical/agent present, the temperature, relative humidity, and breathing (flow) rate through →	46,51

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
US - NFPA 1951 Ensembles (Urban Search and Rescue) 02 - Related Elements - Continued			
Respirator, Powered, Air-Purifying - Continued		the canister or cartridge. Air-purifying respirator use is predicated on monitoring of the environment or use of an end-of-service life indicator in order to determine continued protection in accordance with OSHA 29 CFR Part 1910.134.	
US - NFPA 1951 Ensembles (Urban Search and Rescue) 03 - Optional Elements			
System, Personal Alert Safety (PASS)	01US-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. All PASS are required to be automatically activated when used. ---------- PASS should be mounted such that the alarm signal will not be muffled, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Undergarment, Flame-Resistant	01US-03-UNDF Undergarment, Flame-Resistant (certified as compliant with NFPA 2112 or the optional flame resistance requirements of NFPA 1975)	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. ---------- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,88,99
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 01 - Required Equipment			
Ensemble, Vapor-Protective, with Optional C/B and Flash Fire Protection, NFPA 1991	01VF-01-ENSM NFPA 1991 vapor-protective ensemble with optional C/B and flash fire protection, including totally encapsulating suit with attached or separate	NFPA 1991 defines an ensemble consisting of a suit with attached gloves that totally encapsulates the wearer and his or her breathing apparatus. Ensembles are frequently configured with an overcover, outer gloves, and outer boots in order to meet the requirements of the standard; however, some products can meet the requirements without these extra layers. Suit materials, including visors and seams, are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. NFPA 1991 also includes optional criteria for liquefied gas protection, flash fire escape protection, and chemical/biological →	44,45, 82,93

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 01 - Required Equipment - Continued			
Ensemble, Vapor-Protective, with Optional C/B and Flash Fire Protection, NFPA 1991 - Continued	gloves and footwear or booties with outer boots (certified as compliant with NFPA 1991 with chemical/biological terrorism option and flash fire protection options).	terrorism agent protection (also addressed in NFPA 1994). Additional criteria are provided for each of the certification options. Product labels must clearly indicate which options apply to the specific ensemble. For flash fire protection, suit materials are assessed for thermal insulation, static charge generation, and as part of the ensemble in a simulated flash fire. The primary purpose of NFPA 1991 is to define requirements that isolate the wearer from a surrounding hazardous chemical environment. ---------- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. The flash fire option on certified NFPA 1991 ensembles is for escape only. Users should not knowingly enter a flammable or explosive atmosphere. Level A ensembles should not be used without extensive training. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	
Footwear, Vapor-Protective, with Optional C/B and Flash Fire Protection, NFPA 1991	01VF-01-FTWR NFPA 1991 vapor-protective footwear with optional C/B and flash fire protection (certified as compliant with NFPA 1991 with chemical/biological terrorism option and flash fire protection options).	Footwear may be attached to suits as part of an overall ensemble. Alternatively, the footwear system may consist of a bootie (sock-like extension of the suit) combined with an outer boot. The footwear system must provide a gas-tight interface with the suit. Footwear are evaluated as part of the ensemble for gas-tight integrity. Materials are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. Footwear are further evaluated for physical properties (impact, abrasion, cut, puncture, cold temperature performance) and function (traction). For flash fire protection, footwear is assessed for thermal insulation, static charge generation, and as part of the ensemble in a simulated flash fire. ---------- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. The flash fire option on certified NFPA 1991 ensembles is for escape only. Users should not knowingly enter a flammable or explosive atmosphere. Level A ensembles should not be used without extensive training. Selected footwear must be sized accordingly to fit both the individual and interface properly with the ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,93

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 01 - Required Equipment - Continued			
Gloves, Vapor-Protective, with Optional C/B and Flash Fire Protection, NFPA 1991	01VF-01-GLOV NFPA 1991 vapor-protective gloves with optional C/B and flash fire protection (certified as compliant with NFPA 1991 with chemical/ biological terrorism option and flash fire protection options).	Gloves are attached to suits as part of an overall ensemble. The gloves may be one or more layers (multiple gloves) with a gas-tight interface with the suit sleeve. Gloves are evaluated as part of the ensemble for gas-tight integrity. Materials are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. Gloves are further evaluated for physical properties (cut, puncture, cold temperature performance) and function (dexterity). For flash fire protection, gloves are assessed for thermal insulation, static charge generation, and as part of the ensemble in a simulated flash fire. ---------- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for the severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. The flash fire option on certified NFPA 1991 ensembles is for escape only. Users should not knowingly enter a flammable or explosive atmosphere. Level A ensembles should not be used without extensive training. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,93
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 02 - Related Equipment			
Hardhat	01VF-02-HHAT Hardhat (certified as compliant to ANSI 89.1)	Hardhat consists of shell with suspension; the suspension generally consists of a chin strap or nape strap (worn behind the head) or both. Some hardhats may contain padding for additional impact protection. ---------- Minimum hardhat should be a Class G (general). Hardhat is worn inside encapsulating suit for head protection. Selected suit must accommodate hardhat; the hardhat should not interfere with head movement or wearing of SCBA. Use of head protection should be in accordance with OSHA 29 CFR 1910.135.	47,67
Equipment, Inflation Testing	01VF-02-ITST Inflation testing equipment specific to Item 01VF-01-ENSM.	Inflation testing equipment includes a pump or air source, a pressure gauge, tubing, and fixtures for attachment of tubing to suit. The kit permits the blockage of exhaust valves and inflation of the suit to check gas-tight integrity according to ASTM F 1052, Standard Test Method for Pressure Testing Vapor Protective Ensembles. ---------- Inflation testing equipment should work with the selected NFPA 1991 ensemble.	72

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 02 - Related Equipment - Continued			
SCBA, CBRN	01VF-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. ---------- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	44,46,51, 54,82,85, 90
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01VF-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01VF-02-SCBA.	Types of kits vary with specific SCBA. ---------- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
Suit, Training	01VF-02-TRST Training suit based on similar design, but	Encapsulating suit that is constructed in similar manner as NFPA 1991 ensemble. Suit uses different materials but similar design. Suits will not have same level of integrity or material performance as NFPA 1991 ensemble. →	

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 02 - Related Equipment - Continued			
Suit, Training - Continued	different materials as Item 01VF-01-ENSM.	---------- Training suits must never be used in actual operations and must be clearly marked by the user organization to prevent their misuse.	
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 03 - Optional Equipment			
Covers, Outer Footwear	01VF-03-FTWC Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. ---------- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	
Gloves, Inner, Cotton	01VF-03-GLIC Inner cotton gloves (no standard currently applies for this item).	Knit cotton gloves worn under ensemble gloves for increased comfort. Gloves may be one-piece or formed from multiple pieces. ---------- Gloves should fit intimately onto wearer's hands. Gloves must be 100% cotton and be relatively light weight to prevent loss of hand function when worn with other gloves.	
Gloves, Outer, Disposable	01VF-03-GLOD Outer disposable gloves for contamination protection (marked in accordance with ANSI/ISEA 105).	Gloves may use a variety of different materials, are provided in different lengths and sizes, and include other features such as grip finishes and cuff end designs. ---------- Unsupported gloves should be used which provide a performance level of 2 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Supported gloves should be avoided as fabric inserts will absorb chemicals. These gloves should also be free from holes as required in ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. If rugged physical environment is involved, work gloves should be used in lieu of disposable outer gloves. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
Gloves, Outer, Work	01VF-03-GLOW Outer work gloves for physical hazard protection	Outer work gloves are made of materials that provide a relatively high degree of physical hazard resistance. Gloves are available in a variety of materials, construction styles, and cuff styles. → ----------	48,69

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VF - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection and Optional Flash Fire Protection 03 - Optional Equipment - Continued			
Gloves, Outer, Work - Continued	(marked in accordance with ANSI/ISEA 105).	Work gloves should provide a performance level of 3 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. Use gloves in accordance with OSHA 29 CFR 1910.138.	
System, Personal Alert Safety (PASS)	01VF-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Undergarment, Coverall, Disposable	01VF-03-UNDD Disposable coverall undergarment for contamination control (no standard currently applies for this item).	A disposable coverall worn underneath will generally be constructed of a non-woven material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). --- The selected coverall should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01VF-03-UNDF Flame-resistant undergarment (certified as compliant with NFPA 2112 or meeting the optional flame resistance requirements of NFPA 1975)	Garments are constructed of intrinsically flame resistant or flame retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict ovement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	88,99

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 01 - Required Elements			
Ensemble, Vapor-Protective, with Optional C/B Protection, NFPA 1991	01VT-01-ENSM NFPA 1991 vapor-protective ensemble with optional C/B protection, including totally encapsulating suit with attached or separate gloves and footwear or booties with outer boots (certified as compliant with NFPA 1991 with chemical/biological terrorism option).	NFPA 1991 defines an ensemble consisting of a suit with attached gloves that totally encapsulates the wearer and his or her breathing apparatus. Ensembles are frequently configured with an overcover, outer gloves, and outer boots in order to meet the requirements of the standard; however, some products can meet the requirements without these extra layers. Suit materials, including visors and seams, are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. NFPA 1991 also includes optional criteria for liquefied gas protection, flash fire escape protection, and chemical/biological terrorism agent protection (also addressed in NFPA 1994). Additional criteria are provided for each of the certification options. Product labels must clearly indicate which options apply to the specific ensemble. The primary purpose of NFPA 1991 is to define requirements that isolate the wearer from a surrounding hazardous chemical environment. ---------- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. Level A ensembles should not be used without extensive training. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,93
Footwear, Vapor-Protective, with Optional C/B Protection, NFPA 1991	01VT-01-FTWR NFPA 1991 vapor-protective footwear with optional C/B protection (certified as compliant with NFPA 1991 with chemical/biological terrorism option).	Footwear may be attached to suits as part of an overall ensemble. Alternatively, the footwear system may consist of a bootie (sock-like extension of the suit) combined with an outer boot. The footwear system must provide a gas-tight interface with the suit. Footwear is evaluated as part of the ensemble for gas-tight integrity. Materials are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. Footwear is further evaluated for physical properties (impact, abrasion, cut, puncture, cold temperature performance) and function (traction). ---------- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. Level A ensembles should not be used without extensive training. Selected footwear must be sized accordingly to fit both the individual and interface properly with the ensemble. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,93

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 01 - Required Elements - Continued			
Gloves, Vapor-Protective, with Optional C/B Protection, NFPA 1991	01VT-01-GLOV NFPA 1991 vapor-protective gloves with optional C/B protection (certified as compliant with NFPA 1991 with chemical/biological terrorism option).	Gloves are attached to suits as part of an overall ensemble. The gloves may be one or more layers (multiple gloves) with a gas-tight interface with the suit sleeve. Gloves are evaluated as part of the ensemble for gas-tight integrity. Materials are evaluated for permeation resistance against 21 different industrial chemicals and 5 chemical warfare agents. Gloves are further evaluated for physical properties (cut, puncture, cold temperature performance) and function (dexterity). --- NFPA 1991 defines the highest level of protection for hazardous material emergencies and replaces 'Level A' (not all 'Level A' suits can qualify as NFPA 1991 compliant products). NFPA 1991 ensembles are intended for the severe chemical exposure skin hazards. The suits are designed to provide protection from gases, vapors, liquids, and particulates. Level A ensembles should not be used without extensive training. Selected gloves must be attached to the ensemble to provide a gas-tight interface. Use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.132, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition.	44,45, 82,93
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 02 - Related Elements			
Hardhat	01VT-02-HHAT Hardhat (certified as compliant to ANSI 89.1)	Hardhat consists of shell with suspension; the suspension generally consists of a chin strap or nape strap (worn behind the head) or both. Some hardhats may contain padding for additional impact protection. --- Minimum hardhat should be a Class G (general). Hardhat is worn inside encapsulating suit for head protection. Selected suit must accommodate hardhat; the hardhat should not interfere with head movement or wearing of SCBA. Use of head protection should be in accordance with OSHA 29 CFR 1910.135.	47,67
Equipment, Inflation Testing	01VT-02-ITST Inflation testing equipment specific to Item 01VT-01-ENSM	Inflation testing equipment includes a pump or air source, a pressure gauge, tubing, and fixtures for attachment of tubing to suit. The kit permits the blockage of exhaust valves and inflation of the suit to check gas-tight integrity according to ASTM F 1052, Standard Test Method for Pressure Testing Vapor Protective Ensembles. --- Inflation testing equipment should work with the selected NFPA 1994 Class 1 ensemble.	72

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 02 - Related Elements - Continued			
SCBA, CBRN	01VT-02-SCBA CBRN SCBA - Self-Contained Breathing Apparatus certified as compliant with NFPA 1981 and certified by NIOSH as compliant with the CBRN approval criteria.	SCBA consists of a harness, air cylinder, first stage regulator, low pressure hose, second stage regulator, end-of-service-time indicator (EOSTI) and facepiece. SCBA are typically rated for 30, 45, and 60 minutes of service life, but may be rated for other service lives in accordance with 42 CFR Part 84. Variations exist in harness design, types of cylinders, and facepieces. --- CBRN SCBA are intended for the worst case circumstances, where the substance involved creates an immediate threat, is unidentified, of unknown concentration, oxygen deficient, or determined to be immediately dangerous to life and health (IDLH). Such situations would occur where there is still an on-going release with likely gas/vapor exposure, the responder is close to the point of release, and most victims in the area appear to be unconscious or dead from exposure. Stay times in the hazard zone are likely to be short and limited by the breathing air available from the CBRN SCBA. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. Direct contact with CBRN agents requires proper handling of the SCBA after each use and between multiple entries during the same use. Decontamination and disposal procedures must be followed. If contaminated with liquid chemical warfare agents, dispose of the SCBA after decontamination. SCBA should not be used beyond 6 hours after initial exposure to chemical warfare agents to avoid possibility of agent permeation. CBRN SCBA facepieces must be specifically fit tested for individual first responders in accordance with OSHA 29 CFR Part 1910.134. Other use considerations are provided in OSHA Title 29 CFR Sections 1910.120 and 1910.134, and NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2000 Edition. Selection, care, and maintenance are covered in NFPA 1852, Standard on Selection, Care and Maintenance of Open-Circuit, Self-Contained Breathing Apparatus, 2002 Edition.	44,46,51, 54,82,85, 90
Cylinders and Valve Assemblies, Spare, and Service/Repair Kits, SCBA	01VT-02-SCBC Spare SCBA Cylinders and valve assemblies, and service/repair kits for item 01VT-02-SCBA.	Types of kits vary with specific SCBA. --- Cylinders and service/care kits must be specific to SCBA being used. Individuals using these items must be trained by manufacturer or manufacturer's representative.	51,59
Suit, Training	01VT-02-TRST Training suit based on similar design, but	Encapsulating suit that is constructed in similar manner as NFPA 1991 ensemble. Suit uses different materials but similar design. Suits will not have same level of integrity or material performance as NFPA 1991 ensemble. →	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 02 - Related Elements - Continued			
Suit, Training - Continued	different materials as Item 01VT-01-ENSM.	---------- Training suits must never be used in actual operations, and must be clearly marked by the user organization to prevent their misuse.	
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 03 - Optional Elements			
Covers, Outer Footwear	01VT-03-FTWO Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. ---------- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	
Gloves, Inner, Cotton	01VT-03-GLIC Inner cotton gloves (no standard currently applies for this item).	Knit cotton gloves worn under ensemble gloves for increased comfort. Gloves may be one-piece or formed from multiple pieces. ---------- Gloves should fit intimately onto wearer's hands. Gloves must be 100% cotton and be relatively light weight to prevent loss of hand function when worn with other gloves.	
Gloves, Outer, Disposable	01VT-03-GLOD Outer disposable gloves for contamination protection (marked in accordance with ANSI/ISEA 105).	Gloves may use a variety of different materials, are provided in different lengths and sizes, and include other features such as grip finishes and cuff end designs. ---------- Unsupported gloves should be used which provide a performance level of 2 for cut, puncture and abrasion resistance per ANSI/ISEA 105. Supported gloves should be avoided as fabric inserts will absorb chemicals. These gloves should also be free from holes as required in ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. If rugged physical environment is involved, work gloves should be used in lieu of disposable outer gloves. Use gloves in accordance with OSHA 29 CFR 1910.138.	48,69
Gloves, Outer, Work	01VT-03-GLOW Outer work gloves for physical hazard protection	Outer work gloves are made of materials that provide a relatively high degree of physical hazard resistance. Gloves are available in a variety of materials, construction styles, and cuff styles. ---------- Work gloves should provide a performance level of 3 for cut, puncture and abrasion resistance →	48,69

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
VT - NFPA 1991 Ensembles with Optional Chemical/Biological Terrorism Protection 03 - Optional Elements - Continued			
Gloves, Outer, Work - Continued	(marked in accordance with ANSI/ISEA 105).	per ANSI/ISEA 105. Gloves should be sized to fit over existing ensemble glove system with minimum of bulk to prevent loss of hand function. Use gloves in accordance with OSHA 29 CFR 1910.138.	
System, Personal Alert Safety (PASS)	01VT-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. PASS may be either separate or integrated into SCBA. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled if not part of the SCBA, and such that the device does not interfere with the wearing of other ensemble items. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91
Undergarment, Coverall, Disposable	01VT-03-UNDD Disposable coverall undergarment for contamination control (no standard currently applies for this item).	A disposable coverall worn underneath will generally be constructed of a non-woven material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). --- The selected coverall should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01VT-03-UNDF Flame-resistant undergarment (certified as compliant with NFPA 2112 or meeting the optional flame resistance requirements of NFPA 1975)	Garments are constructed of intrinsically flame resistant or flame retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	88,99

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
XD - Explosive Ordnance Disposal 01 - Required Elements			
Clothing, Operational, and Specialized/ Protective Gear IED/EOD	01XD-01-BODY IED/EOD Protective Ensemble System equipment, Foot Protection System Component to IED/EOD Protective Ensemble System, flame retardant outerwear, eye/ear protection.	Clothing gear should be constructed with flame-resistant and fire-retardant materials. ---------- Performance criteria and standards are currently being developed by NIJ and DHS under the management oversight of NIST- Office for Law Enforcement Standards (OLES) with technical support from Army Natick Soldier Center.	78
Equipment, Head and Face Protection, IED/EOD	01XD-01-FACE Helmet Protective System Component to IED/EOD Protective Ensemble System, forced air system.	The protective helmet component provides an easily adjustable, comfortable helmet retention and suspension system that provides maximum stability and retention while facilitating removal during doffing. A washable, flame resistant head cover such a balaclava should be provided and used with this protective helmet component. The helmet must provide adequate protection against fragmentation and ballistic threats to the neck, head and face. The helmet must also provide appropriate impact protection to the head against impact the ground or other stationary objects. ---------- For operations in a chemical or biological contaminated environment, IED/EOD protective helmet systems can be procured with integrated inhalation protection. These types of helmets can also be used with NIOSH-CBRN certified respiratory protective equipment to provide inhalation protection in the event of a chemical, biological or radiological threat release. Integrated communications (radio) systems are available from manufacturers and vendors. Performance criteria and standards are currently being developed by NIJ and DHS under the management oversight of NIST- Office for Law Enforcement Standards (OLES) with technical support from Army Natick Soldier Center.	78
Equipment, Hand Protection, IED/EOD	01XD-01-HAND Hand Protection System Component to IED/EOD Protective Ensemble System, protective gloves and ballistic hand covers.	Protective handwear should be constructed with flame-resistant and fire-retardant materials, but still allow adequate hand dexterity for the wearer to allow explosive device mitigation and disposal operations. ---------- Performance criteria and standards are currently being developed by NIJ and DHS under the management oversight of NIST- Office for Law Enforcement Standards (OLES) with technical support from Army Natick Soldier Center.	78

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
XD - Explosive Ordnance Disposal 01 - Required Elements - Continued			
Suit, Improvised Explosive Device/ Explosive Ordnance Disposal (IED/EOD) Protective Ensemble	01XD-01-SUIT Suit to provide protection from fragmentation, blast overpressure, heat and light flash, and flame generated by an Improvised Explosive Device (IED), explosives, or Unexploded Ordnance (UXO).	This type of protective ensemble is a whole body protective outfit that can be rapidly donned and doffed. The protective ensemble must allow the wearer adequate situational awareness, mobility and comfort when conducting reconnaissance, render safe, or disruption procedures involving an explosive threat device. These types of protective ensembles products can offer limited chemical and biological threat protection depending on specific manufacturer designs. --- This type of protective ensemble is not specifically designed to provide protection to the wearer from chemical, biological or radiological threats. However, this ensemble can be worn with protective ensembles designed for these type of threat hazards. Bomb disposal technicians wearing these types of protective ensembles can be subjected to the physiological effects of heat stress. Commercial personal cooling systems are sold as accessory components to these type of ensembles. Additional ensemble may be needed for chemical/biological protection (see NFPA 1994, Class 1, 2, or 3 ensembles)	78
XD - Explosive Ordnance Disposal 03 - Optional Elements			
Covers, Outer Footwear	01XD-03-FTWO Disposable outer footwear covers for contamination hazard protection (no standard currently applies for this item).	Footwear covers are rubber, textile, or plastic-based materials that are shaped into a cover that can be worn over boots. Footwear covers are intended to provide additional protection from contamination and, consequently, are disposable after use. --- Footwear covers should not interfere with ensemble wearing. The wear surface of the footwear cover should provide some level of traction to prevent slipping. The footwear cover design should not allow penetration of liquids in through the top of the cover. Consequently, the footwear cover should be worn on the ensemble in a fashion that will prevent any liquid entry at the top.	
System, Personal Alert Safety (PASS)	01XD-03-PASS PASS Device - Personal Alert Safety System (certified as compliant with NFPA 1982).	Personal Alert Safety Systems (PASS) provide an alarm whenever the wearer is motionless for 30 seconds or more. PASS provide audible alarms to aid in the location of a downed firefighter or first responder. These devices are built to be relatively small, rugged, and resistant to extreme physical or environmental conditions. All PASS are required to be automatically activated when used. --- PASS should be mounted such that the alarm signal will not be muffled. For use, see NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition.	82,91

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
XD - Explosive Ordnance Disposal 03 - Optional Elements - Continued			
Undergarment, Coverall, Disposable	01XD-03-UNDD Disposable coverall undergarment for contamination control (no standard currently applies for this item).	A disposable coverall worn underneath will generally be constructed of a non-woven material with various options for sleeve ends (cut or elasticized), pant cuffs (cut, elasticized, or bootie feet), front closure (zipper or tape or combination), and hood design (open, drawstring, or elasticized). --- The selected coverall should be relatively light weight and not restrict movement. It should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble.	
Undergarment, Flame-Resistant	01XD-03-UNDF Flame-resistant undergarment (certified as compliant with NFPA 2112 or the flame-resistant option of NFPA 1975).	Garments are constructed of intrinsically flame-resistant or flame-retardant treated materials of varying weights. Garment designs may include coveralls, or shirt and pant outfits with variations in specific styling features. --- The selected coverall or pants and shirt should be relatively light weight and not restrict movement. They should be sized for a relatively close fit with the individual to prevent interference with wearing of the ensemble. Use undergarments as specified in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 Edition. Selection, care, use, and maintenance of garments per NFPA 2113, Standard for Selection, Care, Use, and Maintenance of Flame Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition.	82,88,99, 100
ZP - Ancillary Equipment			
Garment/Vest/ Device, Cooling	01ZP-00-COOL Cooling garment, vest, or device (no standard currently applies for this item).	Cooling garments may be active or passive, and involve a range of different technologies. Typical designs include vests and garments, though other types of devices such as vortex tubes and umbilical airlines can be used. Passive devices (such as "ice" vests) provide cooling without the ability for user adjustment. Active devices usually involve some form of circulating fluid or air, which may require a power source and peripheral equipment for operation. Devices differ in their cooling capacity, weight, bulk, complexity, operating conditions, and effectiveness. --- Tradeoffs exist between the additional weight and burden of cooling device versus its cooling performance. Some devices may add complexity to donning efficiency. The effectiveness of the device will vary with the type of technology used for cooling. There are advantages and disadvantages to each type of device. The selected device should work without interfering with the wearing of the selected ensemble, and without creating integrity or protection deficiencies.	

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
ZP - Ancillary Equipment - Continued			
Mask, Escape	01ZP-00-ESCA General purpose mask designed for short duration protection sufficient for evacuation.	Quick donning, short duration respiratory protection with limited protection against chemicals, biological agents, and radiological particles for escape purpose only. --- 1. Failure to properly use and maintain this product could result in injury or death. 2. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations. 3. Refer to User's Instructions and/or maintenance manuals for information on use and maintenance of these respirators. 4. Consult manufacturer's User Instructions for information on the use, storage, and maintenance of these respirators at various temperatures. 5. This respirator provides respiratory protection against inhalation of radiological and nuclear dust particles. This respirator provides limited dermal protection to the head area and eyes. 6. Some CBRN agents may not present immediate effects from exposure, but can result in delayed impairment, illness, or death. 7. Direct contact with CBRN agents requires proper handling of the respirator after use. Correct disposal procedures must be followed. These limitations are not all inclusive. The respirator manufacturer may also identify further cautions and limitations for their respirators. In addition, regulatory agencies may also place a limit on the use of respirators in their standards.	52
Tester, Mask Leak/Fit	01ZP-00-FTST A device used for performing fit testing of respirator facepieces to determine quality of face to mask seal.	Fit testing equipment for respirator masks may be either qualitative or quantitative. Qualitative equipment involves the use of a innocuous agent (e.g., isoamyl acetate or irritant smoke) with the wearer determining whether the substance can be detected once the respirator is donned. Quantitative leak/fit testers involve measurement of particulate or dust leakage inside the wearer's breathing zone for determining the protection factor provided by the specific mask on the individual being tested. A protection factor is the ratio of contaminant concentration in the outside environment to contaminant concentration in the breathing zone. --- The selected mask leak/fit tester should accommodate the types of respirator facemasks used by the organization. The tester should be used by a trained individual. Fit testing should be in accordance with OSHA Title 29 Code of Federal Regulations Part 1910.134.	46

1 Use numbers given to refer to Standards List at the end of this document.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]
ZP - Ancillary Equipment - Continued			
Bag/Box, Ensemble Gear Storage	01ZP-00-GBAG Ensemble gear storage bag or box (no standard currently applies for this item).	Soft or hard storage that is capable of holding ensemble and related equipment. --- Bag or box should be sufficiently large to prevent compression and overstuffing of equipment. Bag or box should also be free of sharp edges or rough surfaces that could damage ensemble materials.	
Stool/Table	01ZP-00-STLB Backless stool or table, for use in donning protective equipment/garments.	Should be very sturdy and set on flat, even surface.	
Vest or Outer Garment, High visibility	01ZP-00-VEST High visibility vest or outer garment, (certified as compliant with ANSI/ISEA 107)	ANSI/ISEA 107 specifies three different visibility classes of apparel based on the intended use and activity of the wearer. Class 1 is the lowest class, class 3 is the highest. Differences in the classes are based on the relative amount of background (fluorescent) and retroreflective materials. Fluorescent materials are intended for daytime visibility, while retroreflective materials provide enhancement of wearer visibility at nighttime. ANSI/ISEA 107 specifies design requirements for the placement of reflective materials on clothing items. Fluorescent materials may be lime-green, orange-red, or red. --- If worn, an outer high visibility garment or vest should be selected so as to not interfere with the wearing of the ensemble. The appropriate class of high visibility garment should be chosen based on the guidance provided in Appendix B of ANSI/ISEA 107.	70

1 Use numbers given to refer to Standards List at the end of this document.

Overview

This section contains equipment needed to sustain operations and provide general support during WMD response operations. In previous editions, this section also included references. All references have now been moved to Section 9.

New Sub-Section Headings for 2004

The previous version of this section contained only two categories - general equipment, and equipment for explosive device remediation. This year, several additional categories have been added, including Optics, Scene Control, Rope Safety, and Logistical/Administrative Support Equipment. The resulting structure should make it easier to locate desired items and see other related items.

Expanded Content

This year's section also includes several new fields designed to assist readers in selecting appropriate equipment items:

- Standards - where possible, applicable standards are listed by providing a reference number that can be used to find the standard in the listing at the end of the SEL.
- Features - lists desirable characteristics or capabilities of the item.
- Operating Considerations - other relevant information regarding the procurement or use of the specific item, such as safety issues, limitations, special characteristics, etc.

Selection Matrix

Like most sections in the 2004 SEL, the Operational Equipment section includes a selection matrix to assist readers in quickly identifying appropriate equipment items. For this section, the Subgroup chose to use proficiency level as the rows, and hazard environment as the columns of its matrix.

The rows of the selection matrix represent proficiency level. In addition to any specific training required to operate an individual piece of equipment, the equipment operator must possess the skills necessary to meet the recommended proficiency level. The factors considered in determining this level include the anticipated location of operation of the equipment (i.e. hot zone, warm zone, or cold zone), the complexity of the equipment, and the necessity of chemical or biological training or expertise. The definitions used for proficiency levels have been adapted using NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents, as a starting point. They are:

- **Awareness Level.** Responders at the awareness level are those persons who, in the course of their normal duties, can be the first on the scene of an incident. First responders at the awareness level are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel, and secure the area.
- **Operational Level.** Responders at the operational level are those persons who respond to WMD incidents as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property.
- **Technician Level.** Technicians are those persons possessing special training who respond to incidents for the purpose of control, active response, or remediation. Technicians are expected to use specialized equipment such as chemical protective clothing and control equipment.

- **Specialist Level.** Specialists are those persons possessing advanced special training who respond to incidents for the purpose of providing specialized assistance in control, active response, or remediation. Specialists are expected to use complex equipment to perform tasks restricted to those with specific advanced training.
- **Command Level.** Command level personnel include the incident commander and other staff members. The incident commander is that person who is responsible for all decisions relating to the management of the incident and site operations.

The columns of the matrix represent the particular hazard environment(s) for which each item is suitable. The columns address the commonly used CBRNE nomenclature. However, for our purposes it is useful to represent the Nuclear "N" as part Thermal, part Explosive, and part Radiological. Therefore, the columns used for the SEL are:

- **Chemical**
- **Biological**
- **Radiological**
- **Nuclear**
- **Thermal**
- **Explosive**

Combining these two axes produces a selection matrix within which items can be categorized. In this printed version of the SEL, there will be areas entitled "Proficiency Level" and "Hazards" that will contain appropriate codes for each item. In the on-line version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a functional level and one or more threat/incident types.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EQ - Equipment					
Back Pack, Modular	02EQ-00-BKPK Modular back pack for carrying personal items or equipment to forward locations.			A,O,T,S,I	C,B,R,T,E
Compressor, Air	02EQ-00-COMP Air compressor suitable for refilling self contained breathing apparatus (SCBA).			O,T,S	C,B,R,T,E
Carts, Portable Air Cylinder	02EQ-00-CPAC Portable air cylinder carts for carrying spare cylinders to forward locations.			O,T,S	C,B,R,T,E
Fan, Explosive-proof Exhaust	02EQ-00-FANE Explosive-proof exhaust fan	Positive or negative pressure --- Concerns regarding discharge air. If exhausting gases and vapors from an enclosed area, consideration should be given to the target discharge area.	81	A,O,T,S	C,B,R,T,E
Cables, Grounding	02EQ-00-GRCA Grounding cables, point-type clamps on both ends; 1/8" stainless steel (uninsulated) 50' minimum.	Reducing risk of static electricity discharge in movement of flammable liquids, grounding and bonding operations. --- During transfer operations involving flammable/combustible liquids, containers should be bonded together and grounded.	80,81	O,T,S	C,T,E
Rod, Copper Grounding	02EQ-00-GRRD Copper grounding rod, 3/4" x 6' (minimum length) with slide hammer.	For use in reducing risk of static electricity discharge during movement of flammable liquids, grounding, and bonding operations. --- Used with bonding and grounding equipment.	80,81	O,T,S	C,T,E

1 Use numbers given to refer to Standards List at the end of this document.
2 [A]wareness, [O]perations, [T]echnician, [S]pecialist, [I]ncident Command
3 [C]hemical, [B]iological, [R]adiological, [T]hermal, [E]xplosive

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EQ - Equipment - Continued					
Tester, Ground Resistance	02EQ-00-GRRT Ground resistance tester	Electrical resistance (OHM) electronic device to ensure proper grounding and bonding during movement of flammable liquids.	81	O,T,S	C,T
Kit, Chemical Leak Control	02EQ-00-KTCL Chemical leak control kit	Plugging and patching kits of varying sizes and configurations.		T,S	C,B,R,T,E
Kit, Tool, Miscellaneous, Non-sparking	02EQ-00-KTTL Non-sparking tool kit, to include bung and spanner wrenches.	Tool for use with flammable liquids.		O,T,S	C,B,R,T,E
Munitions, Less Lethal	02EQ-00-LLMN Less lethal munitions for use in tactical law enforcement operations conducted in critical locations.	Specialized needs require a variety of munitions for situations such as refinery, natural gas pipelines, aircraft entries, etc.		O,T,S	C,B,R,T,E
Light, Handheld Illumination	02EQ-00-LTHH Handheld light	Intrinsically safe vs. not intrinsically safe --- Battery life Type Availability	81	A,O,T,S,I	C,B,R,T,E
Lighting System, Helmet Mounted	02EQ-00-LTHM Helmet mounted lighting system	Intrinsically safe vs. not intrinsically safe Mounting system Battery life Type Availability	81	A,O,T,S,I	C,B,R,T,E
Multi-Meter, Electrical	02EQ-00-MMTR Intrinsically safe electrical multi-meter	Can be utilized in PPE.	81	T,S	C,B,R,T,E

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3 [C]hemical, [B]iological, [R]adiological, [T]hermal, [E]xplosive

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EQ - Equipment - Continued					
Overpack	02EQ-00-PCKO Pack, overpack	May be plastic or metal with or without liners. --- Compatible with overpacked product.	50,58	T,S	C,B,R,T,E
Reel, Electric Cord	02EQ-00-REEL Electric cord reel	Twist-lock connectors --- Twist-lock connectors are advantageous during field operations to prevent accidental disconnection.	81	A,O,T,S,I	C,B,R,T,E
Vests, Operational	02EQ-00-VSTO Operational vests; duty gear and modular load bearing systems.	Capable of carrying multiple items such as radio, flashlight, camera, munitions, and antidote/decon kits. --- Depending upon mission, consideration should be given to high or low visibility vest.		A,O,T,S,I	C,B,R,T,E
ES - Miscellaneous Equipment and Supplies					
Bags, Equipment	02ES-00-BGEQ Equipment bags	Gear and PPE storage and tote bags --- Depending upon use, consider protection capability for items to be moved.		A,O,T,S,I	C,B,R,T,E
Bags, Evidence and/or Canisters	02ES-00-BGEV Evidence bags and/or canisters	Chemical compatibility		A,O,T,S	C,B,R,T,E
EX - Equipment - Explosive Device Mitigation and Remediation					
Canines, Explosive Detecting	02EX-00-DOGS Explosive detecting canine, related training, upkeep, upgrades.			O,T,S	E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EX - Equipment - Explosive Device Mitigation and Remediation - Continued					
Equipment, Explosive Entry	02EX-00-EXEN Explosive entry equipment, related training, training facilities, upgrades.	For use by properly trained individuals only.		O,T,S	C,B,R,T,E
Magazines, Portable Explosive	02EX-00-EXMP Portable explosive magazines, suspicious item, fireworks.	For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
Kit, Fiber Optic	02EX-00-KTFO Fiber optic kit (inspection or viewing)	Potential application both in law enforcement surveillance mode and technical rescue search mode.		T,S	C,B,R,T,E
Mitigation Area, Explosive	02EX-00-MITA Explosive/bomb mitigation areas, explosive training, upgrades.	Area in which the bomb technician can safely mitigate/train for Improvised Explosive Devices (IED). For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
Detector, Metal	2EX-00-MTDT Metal detection device			O,T,S	C,B,R,T,E
Equipment, Post Blast Investigation	02EX-00-PBIE Equipment for post blast investigation, explosives/ Improvised Explosive Device (IED) investigation, and training, including upgrades.	Includes equipment for marking, sampling, collecting, photo-graphing, and processing.		O,T,S	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EX - Equipment - Explosive Device Mitigation and Remediation - Continued					
Robot, Attachments, Tools	02EX-00-RBTS Robot, related attachments, tools, and training.	Remote operation and visualization. --- Ability to observe remotely, pick up an item, shoot a disrupter. For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
Robot Upgrades	02EX-00-RBTU Robot upgrades; chemical, biological, nuclear, radiological detection devices, cameras, disruption ability, remote operation.	Includes hardware and software upgrades. --- Ability to upgrade existing robots to measure CBRN, add new cameras, disrupters, remote operations. For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
TCV, Vented Containment Vessel, Transportation	02EX-00-TCVV Total containment vessel, vented, for containment, transportation, or temporary storage.	For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
TCV WMD Upgrades	02EX-00-TCVW WMD upgrades for TCV (Total Containment Vessel), transportation vessel.	For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EX - Equipment - Explosive Device Mitigation and Remediation - Continued					
Tools, Remote Opening, Examination	02EX-00-TLRO Remote opening tools such as rigging kits, pulleys, clamps, probes, mirrors, hand, electric, pneumatic, remote opening, stethoscope, non-sparking tools, etc.			O,T,S	C,B,R,T,E
EX - Equipment - Explosive Device Mitigation and Remediation 01 - X-Ray Equipment					
X-Ray Unit, Portable	02EX-01-XRAP Portable X-Ray Unit, related attachments and equipment, film, image screens, computers for image storing/ transmission, upgrades.	Ability to remotely x-ray a suspect package and save/transmit images. For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
EX - Equipment - Explosive Device Mitigation and Remediation 02 - Tools					
Tools, Explosive, Mitigation	02EX-02-TLEX Explosive tools for Improvised Explosive Device (IED) remediation, such as boot bangers, shape charges, explosive related training, mitigation tents, upgrades, bomb blankets.	For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
EX - Equipment - Explosive Device Mitigation and Remediation 02 - Tools - Continued					
Tool, Pipe Bomb Disabling	02EX-02-TLPB Pipe bomb disabling tools, attachments, disrupter, pipe bomb disablement tools, attachments and related training and upgrades.	For use by accredited public safety bomb squads that meet the accreditation standards as defined by the National Bomb Squad Commanders Advisory Board and outlined in the FBI Bomb Data Center Special Technicians Bulletin 87-4.		T,S	C,B,R,T,E
LG - Logistical/Admin Support					
Bags and Bivys	02LG-00-BAGS Bags and bivys - individual sleeping systems	Personal bags and bivys may be required to support personnel on extended operations.		A,O,T,S,I	C,B,R,T,E
Containers, Hazardous Material Shipping	02LG-00-CHMS Hazardous material shipping containers	Chemically compatible DOT compliant	56	T,S	C,B,R,T,E
Containers, Storage	02LG-00-CONT Storage containers	Rigid Reusable		A,O,T,S,I	C,B,R,T,E
Freezer/Refrigerator	02LG-00-FRZR General purpose freezer/ refrigerator	Check capability to maintain control temperature is used for medications or temperature-sensitive reagents. Voltage requirement; 12v, 24v, 110v, 220v		T,S	C,B,R,T,E
Water Trailers/Source	02LG-00-H2OT Water trailers (potable and non-potable)	Potable water sources must meet water quality standards as regulated by EPA.		A,O,T,S,I	C,B,R,T,E
Housing, Subsistence and Sanitation	02LG-00-HSSF Housing for response forces, subsistence and sanitation (field support).			A,O,T,S,I	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
LG - Logistical/Admin Support - Continued					
System, Collective Protective	02LG-00-SHCP Collective protective system for shelters.			O,T,S,I	C,B,R,T,E
System, Environmental Control	02LG-00-SHEC Environmental control system for shelters.	High efficiency particulate and organic vapor filtration. --- Consider life expectancy of filter system.		T,S	C,B,R,T,E
Shelter Systems, Rapid Deployment	02LG-00-SHLT Rapidly deployable shelter systems, hardwall or softwall (command and control, triage, etc.).			O,T,S,I	C,B,R,T,E
OP - Optics					
Binoculars	02OP-00-BNOC Binoculars			A,O,T,S,I	C,B,R,T,E
Systems, Fiber Optic	02OP-00-FIBR Fiber optic systems that permit remote observation during field operations.			O,T,S	C,B,R,T,E
Spotting Scopes/ Surveillance Telescopes	02OP-00-SCOP Optics capable of use in long range, sometimes long term, observation of critical, tactical operations.			A,O,T,S,I	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
OP - Optics - Continued					
Optics, Thermal Imaging and/or Light Amplification	02OP-00-TILA Thermal imaging and/or light amplification optics.	Video transmission, recording, image size, video overlay --- Intrinsically safe for use in flammable atmospheres. Battery life Availability Recharging	81	O,T,S,I	C,B,R,T,E
RS - Rope Safety					
Harnesses, Life Safety/ Rappelling	02RS-00-HARN Body harnesses used to support a person during rappelling or rope rescue operations.		92	O,T,S	C,B,R,T,E
Hardware, Rappelling or Rescue Operations	02RS-00-ROHA Rappelling hardware, including ascenders, handrope grabs, carabiners, plates, racks, etc.		92	O,T,S	C,B,R,T,E
Rope, Life Safety	02RS-00-ROPE Rope of various diameters and ratings.		92	O,T,S	C,B,R,T,E
Software, Rope	02RS-00-ROSO Includes items such as: Prusik cords, softrope grabs, bags, protection.		92	O,T,S	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
SC - Scene Control					
Monitor, Heat Stress	02SC-00-HSMN Heat stress monitor (ambient and personal)	Area monitoring of wet bulb temperatures (WBGT) or personal monitor.		A,O,T,S,I	C,B,R,T,E
Kit, First Aid, Trauma Type	02SC-00-KTFA Trauma type first aid kit			A,O,T,S	C,B,R,T,E
Lighting, Portable Area Illumination	02SC-00-LTPA Portable area illumination		81	A,O,T,S,I	C,B,R,T,E
Public Address System	02SC-00-MEGA Megaphone/public address system			A,O,T,S,I	C,B,R,T,E
Signs	02SC-00-SIGN Restricted access and caution warning signs	Night visibility Mountable on hard surfaces Wind resistance		A,O,T,S,I	C,B,R,T,E
Timer	02SC-00-TIMR Timer or stopwatch			O,T,S,I	C,B,R,T,E
Tape, Boundary Marking	02SC-00-TPBM Boundary marking tape: YELLOW Caution/RED Danger/Incident specific (i.e., radiological, biological, chemical).			A,O,T,S,I	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
SC - Scene Control 01 - Systems					
System, Access Control	02SC-01-ACCS Access control system and badges	Field deployable --- Consumables requirements such as badging materials.		O,T,S	C,B,R,T,E
System, Capture and Containment	02SC-01-CACS Capture and containment system			T,S	C,B,R,T,E
System, Marking, Green Line/Red Line	02SC-01-GLRL Marking system, Green Line/Red Line, battery activated or appropriate substitute.	LEDs for use in low visibility areas		A,O,T,S,I	C,B,R,T,E
System, Lock Out/Tag Out	02SC-01-LOTO Lock Out/Tag Out system		49	T,S	C,B,R,T,E
SE - Safety Equipment					
Balaclava, Fire Resistant	02SE-00-BALA Fire resistant/retardant hood that affords protection from explosive flashes.			O,T,S	T,E
Extinguisher, Fire, Class ABC	02SE-00-EXAC Fire extinguisher, Class ABC		79	A,O,T,S	C,B,R,T,E
Extinguisher, Fire, Class D	02SE-00-EXDD Fire extinguisher, Class D	For use on small amounts of metals.	79	O,T,S	C,B,R,T,E
Protection, Eye	02SE-00-EYEP Eye protection for field operations.		66	A,O,T,S,I	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
SE - Safety Equipment - Continued					
Gloves, Protective, Abrasion-Resistant	02SE-00-GLVA Puncture, cut, and abrasion-resistant gloves.	Gloves should provide a performance level of 3 for cut, puncture and abrasion resistance per ANSI/ISEA 105.	69	O,T,S	C,B,R,T,E
Gloves, Protective, Fire-resistant	02SE-00-GLVF Gloves that provide heat and flash protection.	Gloves should meet fire resistance requirements of ANSI/ISEA 105.	69	O,T,S	T,E
Protection, Hearing	02SE-00-HEAR Hearing protection for operations in potentially high noise environments.	Insert or muff style protection. --- Check Noise Reduction Rating (NRR)		A,O,T,S,I	C,B,R,T,E
Hydration System, Personal	02SE-00-HYDR Personal hydration system	Chemical resistance and compatibility with approved respirators		A,O,T,S,I	C,B,R,T,E
Lights, Hand, Explosion Proof	02SE-00-LTHE Explosion proof handheld lights	Power sourcing Cords Plugs Compatibility	81	A,O,T,S	C,B,R,T,E
System, Operations Area Personnel Tracking and Accountability	02SE-00-OAPT Operations area personnel tracking and accountability systems			A,O,T,S,I	C,B,R,T,E
Padding, Protective	02SE-00-PRPD General protective pads	Protection for elbows, knees, neck, and shins while conducting operations, including tactical law enforcement or rescue operations.		O,T,S	C,B,R,T,E
Specialized Clothing	02SE-00-SPEC BDUs, protective jumpsuit and related clothing for operational and tactical use.	Flame resistant/flash protection --- Climate	88	A,O,T,S,I	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
VE - Vehicles and Vehicular Support 01 - Vehicles					
Cart, Field	02VE-01-CART Field cart for transporting tools, equipment, or personnel.	Terrain		A,O,T,S,I	C,B,R,T,E
Vehicle, Commercial	02VE-01-VHCL Commercial vehicles with run-fat tires; vans, SUVs, and trucks for personnel transportation and equipment movement.			A,O,T,S,I	C,B,R,T,E
VE - Vehicles and Vehicular Support 02 - Support Packages					
Packages, Maintenance	02VE-02-VHMP Vehicle and equipment maintenance packages.			A,O,T,S,I	C,B,R,T,E

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Overview

This section lists equipment, software, and systems that provide information (data) functionality and interoperability between local and other interagency organizations. The items mentioned serve to develop situational awareness and better coordinate response operations for CBRNE terrorism and homeland security operations.

The 2004 SEL has divided information technology and communications into two distinct sections. While there continues to be a close connection between the two (and even some merging of technologies such as voice communications over the Internet), the separation of sections should make it easier to locate desired equipment items. In addition, a separate section (Section 8) has been established for common power storage and generation, rather than including items such as generators or common batteries in multiple sections of the list.

Expanded Content and Selection Matrix

This year's SEL also includes additional information on each item. In addition to the title and description, we have added information on desirable features, operating limitations, and standards (where applicable). These added fields are designed to enhance the reader's understanding of the defined items and their practical use.

This section also includes a selection matrix. The rows of the matrix reflect the user level required to utilize the equipment, while the columns correspond to the location(s) (with respect to the incident) where the equipment will most likely be utilized.

The user levels for information technology equipment are defined as follows:

End User	Users who possess no special training or other qualifications with respect to the equipment being utilized. Examples would be personal computer users who are familiar with basic applications but have not received any classroom or advanced training.
IT Technician	Users who possess some specialized training or other qualifications with respect to the equipment being utilized. Examples would be users who have attended classroom training for a Geographic Information System, or who have received training in hardware installation and setup.
IT Advanced Technician	Users who possess some extensive training or career-level qualifications with respect to the equipment being utilized. Examples would be trained professional network administrators who possess professional qualifications such as MCSE, or computer repair professionals.

The probable use location(s) are defined as follows:

Rear Information Zone - Strategic	Emergency Operations Center/ Joint Operations Center Intel Support
Rear Information Zone - Operational	Emergency Operations Center/ Departmental Operations Center Intel Support
Forward Information Zone - Support [Cold]	Incident Command Post Intel Support; near incident scene, but in cold zone.
Forward Information Zone - Contamination Reduction [Warm]	Operations/Intel Support in warm zone.
Forward Information Zone - Exclusion [Hot]	Operations/Intel Support in hot zone.

Combining these two axes produces a selection matrix for classifying equipment items. For example, a network router might be classified as requiring an IT Advanced Technician to install and configure, and might be used in the Rear Information Zone or the Forward Information Zone - Support (Cold), but would probably not be used in either the Warm or Hot zones. In this printed version, there will be columns entitled "User Levels" and "Usage Areas" that will contain appropriate codes. In the on-line version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a user level and usage areas.

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CS - Cyber Security Equipment and Software 01 - Encryption				
Software, Encryption	03CS-01-ECRP Encryption software for protecting stored data files or email messages.	See Standards Listing Number 60 for applicable standards. See Standards Listing Number 106 for guidance.	U,T,A	S,O,C
Encryption, Data Transmission	03CS-01-ETRN A class of network access solutions, usually for remote access, that provide encrypted user access. Some will utilize hardware "tokens" in addition to software clients. This includes Virtual Private Networks, and encrypted transmission modes such as SSH and SSL.	See Standards Listing Number 106 for guidance.	U,T,A	S,O,C,W,H
CS - Cyber Security Equipment and Software 02 - Network Perimeter Security				
Firewall, Network	03CS-02-FWAL Firewall (appliance or HW/SW standalone device) for use in protecting networks. See also 03SW-02-PFWL.	See Standards Listing Numbers 106 and 107 for guidance.	A	S,O,C
System, Intrusion Detection	03CS-02-IDS Intrusion Detection System (IDS), deployed at either host or network level to detect unauthorized or aberrant behavior on the network.	Requires trained network security personnel to configure system and interpret warning messages. Prone to false positives. See Standards Listing Number 106 for guidance.	A	S,O,C
CS - Cyber Security Equipment and Software 03 - Host Level Security				
Software, Virus Protection	03CS-03-AVIR Virus protection software	Must maintain current signature file to operate effectively - usually requires a subscription. Can also be deployed at the server or firewall level for entire network segments. See Standards Listing Number 106 for guidance.	U,T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
HW - Hardware 01 - Computers				
Computer, Desktop	03HW-01-DTOP Desktop computer, basic	">" indicates minimum requirement > Video Graphics Adapter (XVGA) > 16-bit audio > 64MB video memory > 2GHz processor DVD / CDRW > 56k modem Network Interface Card (NIC) 10/100 > 40GB hard drive > 2 USB ports >256MB of RAM	U,T,A	S,O,C
Computing Device, Handheld	03HW-01-HHCD Handheld computing devices with connectivity. Includes a variety of platforms such as PDAs and Windows compatible devices.	Variety of Operating Systems available, including Windows CE, Palm OS, etc. ---------- Match mission requirements to OS capabilities and compatibilities. Consider battery life and replacement battery availability.	U,T,A	S,O,C,W,H
Computer, Portable	03HW-01-LAPT Laptop, notebook or tablet computer, basic	">" indicates minimum requirement > Video Graphics Adapter (XVGA) > 16-bit audio > 32MB video memory > 1.5GHz processor DVD/CDRom > 56k modem Network Interface Connection (NIC) 10/100 > 15GB hard drive (removable) PC MCIA slot > 256MB RAM ---------- Comparable processor speeds may be lower if Pentium® M Chips are used in the machine.	U,T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
HW - Hardware 01 - Computers - Continued				
Computer, Server	03HW-01-SRVR Computer used as central host to provide connectivity or data to other systems.	Server operating system, often Unix, Linux, Windows 2000 Server, or Windows Server 2003	T,A	S,O,C
HW - Hardware 02 - Peripherals				
All-in-One	03HW-02-ALL1 Printer/Copier/Fax/Scanner in single device with either bubblejet or laser printing capability.	Minimum 600 DPI, high quality would be 1200 DPI USB connectivity desirable Network compatibility desirable --- Consumable supplies may be critical, particularly for ink-jet devices. Correct toner cartridges critical for laser devices.	U,T,A	S,O,C
Equipment, Bar Code Reading and Printing	03HW-02-BARC Bar code readers and printers, including devices that have wireless network capabilities.	Tag and readers --- Ensure compatibility of bar code types.	U,T,A	S,O,C,W,H
Plotter	03HW-02-PLOT Output device for producing oversize hard copy output such as maps and visualization graphics.	Minimum 600 DPI, high quality would be 1200 DPI B/W or color Large format --- Consumables (ink supplies) can be critical, and quickly consumed when printing high resolution full-page color.	U,T,A	S,O,C
Printer	03HW-02-PRNT Printer using laser, ink-jet, or bubble-jet technology.	Minimum 600 DPI, high quality would be 1200 DPI B/W or color --- Consumables (toner and ink supplies) can be critical, and quickly consumed when printing high resolution full-page color.	U,T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
HW - Hardware 02 - Peripherals - Continued				
Devices, Radio Frequency Identification	03HW-02-RFID RF Identification Devices (RFID) and associated readers.	Passive and/or active Tag and readers --- Distance sensitive	U,T,A	S,O,C,W,H
Scanner	03HW-02-SCAN Scanner, flatbed or portable	USB connection capability desirable Network compatibility desirable --- May want RF capability in contaminated zones, perhaps via connection to handheld device.	U,T,A	S,O,C,W,H
Storage, Portable External	03HW-02-STOR Devices that function as virtual drives for storage and transfer of files. Includes USB memory sticks, flash drives, smart chips, etc.	Minimum 128MB storage Drive emulation Compatibility with digital cameras --- Check driver requirements. Some devices may fit cameras but require a reader to interface with PC.	U,T,A	S,O,C,W,H
HW - Hardware 03 - Networking Components				
Router	03HW-03-ROUT Network Router. Smaller router devices may also function as a firewall or Wireless Access Point.	Wide variance in size, capacity, and price.	T,A	S,O,C
Server, Serial	03HW-03-SSRV Device that provides a network (TCP/IP) presence for serial devices. Example: printer network adapter.		T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
HW - Hardware 03 - Networking Components - Continued				
Switch, Network	03HW-03-SWCH Network switching device	Wide variance in size, capacity, and price. --- Smaller switches now used in place of hubs, providing better performance.	T,A	S,O,C
Access Point, Wireless	03HW-03-WAP Wireless Access Point (WAP) for local area networking under 802.11x.	802.11g recommended for improved security. --- When using WAPs, require use of Wi-Fi Protected Access (WPA). Do not broadcast network availability. See Standards Listing Number 109 for guidance.	T,A	S,O,C
HW - Hardware 04 - Miscellaneous Adapter Cables/Connections				
Adapter Cables/Connectors	03HW-04-CABL Miscellaneous adapter cables/connectors		U,T,A	S,O,C,W,H
MA - Major Applications/Ensembles 01 - Imaging and Visualization				
Software, GIS	03MA-01-GISS Geographical Information Systems (GIS) Software	Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C
Software, Plume Modeling	03MA-01-PMOD Plume Modeling Software (fate and transport)/databases capable of real time linkage to sensors and meteorological monitoring and detection.	Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
MA - Major Applications/Ensembles 01 - Imaging and Visualization - Continued				
Software, Operational Space Visualization	03MA-01-SVIS Operational Space Visualization Tools	Mapping Graphical display of data Ability to draw from multiple data sources Data mining --- Emerging technology - standards and functionality are still being developed. See Standards Listing Number 77.	U,T,A	S,O,C
MA - Major Applications/Ensembles 02 - Alert/Notification Systems				
Systems, Alert/Notification	03MA-02-ALRT Alert and notification equipment that allows for real-time dissemination of information and intelligence. Examples of this equipment include cellular phones, pagers, text messaging, etc.	'Closed' systems and public alerting systems are available	U,T,A	S,O,C
MA - Major Applications/Ensembles 03 - Position Locating Systems				
Systems, Automatic Vehicle Locating (AVL)	03MA-03-AVLS Automatic Vehicle Locating (AVL) Systems	Both GPS (differential correction) and DR (ded reckoning) capability. Inclusion of DR preferred. --- Procure as package to ensure compatibility.	U,T,A	S,O,C,W,H
Device, Global Positioning System (GPS)	03MA-03-DGPS Device, Global Positioning System (GPS)	Differential GPS (DGPS) compatible WAAS (Wide Area Augmentation System) compatible --- Required unobstructed line of sight to satellites (not used indoors or underground).	U,T,A	S,O,C,W,H

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
MA - Major Applications/Ensembles 03 - Position Locating Systems - Continued				
Systems, Precision Locating Tracking (PLT)	03MA-03-PLTI Precision Locating Tracking Systems (PLT), indoor capable		U,T,A	S,O,C,W,H
MD - Media Devices 01 - Cameras and Surveillance Equipment				
Camera, Still	03MD-01-CMRA Still camera, digital or film	Decontaminable/Disposable Intrinsically safe housing --- Consider consumables (film cameras) and battery life and memory capacity/medium (digital cameras). Digital images may have legal implications - evidentiary standards for digital imagery are still emerging.	U,T,A	C,W,H
Camera, Infrared (IR)	03MD-01-IRED Infrared (IR) a. Thermal b. Forward Looking Infrared Radiation (FLIR)	Decontaminable/Disposable Intrinsically safe housing --- Note calibration requirements and potential cost.	U,T,A	C,W,H
Equipment, Illumination, IR	03MD-01-IRIL Infrared Illumination Equipment	Decontaminable/Disposable Intrinsically safe housing --- Used as a supplement to IR camera and/or detection equipment.	U,T,A	C,W,H
Light Amplification	03MD-01-LAMP Light Amplification (night vision enhancement) equipment	Decontaminable/Disposable Intrinsically safe housing --- Battery availability	U,T,A	C,W,H

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
MD - Media Devices 01 - Cameras and Surveillance Equipment - Continued				
Camera, Video	03MD-01-VCAM Video camera	Intrinsically safe housing Remote operation, including pan, tilt, zoom --- Water-resistant housing accessory desirable for hot-zone operations.	U,T,A	S,O,C,W,H
MD - Media Devices 02 - Projectors				
Projector, Video	03MD-02-PROJ Video projector	XVGA (1024x768) capability highly desirable Remote operation via USB connection desirable Composite TV signal compatibility desirable --- Check lumen and contrast ratings, particularly if operation will be in areas of high ambient lighting. Check bulb life rating and bulb replacement cost.	U,T,A	S,O,C
MD - Media Devices 03 - Displays				
Display, Video	03MD-03-DISP Video display - assorted technologies including: Television, Plasma, LCD, etc.	Plasma screens are subject to image 'burn-in' and may not be advisable for some applications. Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C
SN - Sensor Devices 01 - Remote Sensors				
Station, Portable Meteorological	03SN-01-PTMS Portable meteorological station that monitors (at a minimum) temperature, wind speed, wind direction, precipitation, and barometric pressure.		U,T,A	S,O,C,W

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
SW - Software 01 - Operating Systems				
System, Server Operating	03SW-01-OSSS Operating systems for servers. Examples include Windows, Apple OSX, Unix, Linux.	Minimum version should be: Windows: 2000 or 2003 Apple: OSX Linux: Varies by distribution - latest Kernel version is 2.6 Unix: Varies with brand - check with vendor for current release --- Check provided browser for 128-bit encryption and SSL capability.	T,A	S,O,C
System, Workstation Operating	03SW-01-OSSW Operating systems for workstations. Examples include Windows, Apple OSX, Unix, Linux.	Minimum versions should be: Windows: 2000 or XP Apple: OSX Linux: Varies by distribution - latest Kernel version is 2.6 Unix: Varies with brand - check with vendor for current release --- Check provided browser for 128-bit encryption and SSL capability.	T,A	S,O,C
SW - Software 02 - Application Programs				
Application Program, Credentialing	03SW-02-CRED Software application and associated hardware for creating site/event credential badges.	Additional equipment needs may include: digital cameras, laminating equipment, facial recognition software, and more.	U,T	S,O,C
Software, E-mail Client	03SW-02-EMLC E-mail client software	May be part of office suite. See Standards Listing Number 108 for guidance.	U,T,A	S,O,C
Software, E-Mail Server	03SW-02-EMLS E-Mail Server Software	Need to control relay of outbound mail to prevent server from being used as a spam platform. See Standards Listing Number 108 for guidance.	T,A	S,O

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
SW - Software 02 - Application Programs - Continued				
Software, Facial Recognition	03SW-02-FACR Facial recognition software for access control, identification of criminal actors (IFF), etc.	Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C,W
Software, Instant Messaging	03SW-02-IMSG Instant Messaging (IM) software	Logging capability desirable Enterprise-level systems with encryption are recommended.	U,T,A	S,O,C
Software, Network management	03SW-02-NMGT Network management software for monitoring network performance and/or maintaining configuration.	Trained personnel required for installation and operation.	T,A	S,O,C
Software, Personal Firewall	03SW-02-PFWL Personal firewall software for operation on individual workstations. See also: 03CS-02-NFWL	Some effective shareware available. --- Shareware or purchase	T,A	S,O,C
Software, Video Teleconferencing	03SW-02-VCSW Video teleconferencing software	Up to 4 participants. --- Encryption desirable.	U,T,A	S,O,C
SW - Software 03 - Suites				
Software, ICS	03SW-03-CDSS Incident Command System (ICS) software including command/plans & decision-support tools	Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C
Software, Office Software Suite	03SW-03-OFFC Office software suite (spreadsheet, data-base, word processing and graphics presentation)	Document interoperability is critical when moving between suites.	U,T,A	S,O,C

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
SW - Software 04 - Reference Data Sources				
Software, CBRNE/ Commercial Chemical/ Hazard	03SW-04-CBRN CBRNE/commercial chemical/hazard software and response system	Emerging technology - standards and functionality are still being developed.	U,T,A	S,O,C,W,H

1 End [U]ser, IT [T]echnician, IT [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Overview

This section lists equipment and systems that provide communications functionality, connectivity, and interoperability between local and other interagency organizations. The items mentioned serve to develop situational awareness and better coordinate response operations for CBRNE terrorism and homeland security operations.

The 2004 SEL has divided information technology and communications into two distinct sections. While there continues to be a close connection between the two (and even some merging of technologies such as voice communications over the Internet), the separation of sections should make it easier to locate desired equipment items. In addition, a separate section (Section 8) has been established for common power storage and generation, rather than including items such as generators or common batteries in multiple sections of the list.

Expanded Content and Selection Matrix

This year's SEL also includes additional information on each item. In addition to the title and description, we have added information on desirable features, operating limitations, and standards (where applicable). These added fields are designed to enhance the reader's understanding of the defined items and their practical use.

This section also includes a selection matrix. The rows of the matrix reflect the user level required to utilize the equipment, while the columns correspond to the location(s) (with respect to the incident) where the equipment will most likely be utilized.

The user levels for information technology equipment are defined as follows:

End User	Users who possess no special training or other qualifications with respect to the equipment being utilized. Examples would be users of cellular telephones or 2-way transceivers.
Communications Technician	Users who possess some specialized training or other qualifications with respect to the equipment being utilized. Examples would be users who have attended classroom training for a telephone switch, or who have received training in hardware installation and setup.
Communications Advanced Technician	Users who possess some extensive training or career-level qualifications with respect to the equipment being utilized. Examples would be trained satellite communications professionals capable of setting up and operating complex base stations.

The probable use location(s) are defined as follows:

Rear Information Zone - Strategic	Emergency Operations Center/Joint Operations Center Intel Support
Rear Information Zone - Operational	Emergency Operations Center/Departmental Operations Center Intel Support
Forward Information Zone - Support [Cold]	Incident Command Post Intel Support; near incident scene, but in cold zone.
Forward Information Zone - Contamination Reduction [Warm]	Operations/Intel Support in warm zone.
Forward Information Zone - Exclusion [Hot]	Operations/Intel Support in hot zone.

Combining these two axes produces a selection matrix for classifying equipment items. For example, satellite equipment is classified as requiring at least a Communications Technician to install and configure, and might be used in the Rear Information Zone or the Forward Information Zone - Support (Cold), but would probably not be used in either the Warm or Hot zones. In this printed version, there will be columns entitled "User Levels" and "Usage Areas" that will contain appropriate codes. In the online version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a user level and usage areas.

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CC - Commercial 01 - Cell - Digital				
Phone, Cellular	04CC-01-CELL Digital cellular phone	Locator / Phase II compliant. Wireless Priority Service (WPS) enabled. --- Check coverage area. WPS is only available w/GSM. Check availability of digital service in your area. Ongoing service costs.	U,T,A	S,O,C,W,H
CC - Commercial 02 - Data & Messaging				
Device, Messaging, 2-Way Text	04CC-02-2WAY Text messaging device with 2-way capability	Some devices have Internet capability. Some devices also function as cell phones. --- Consider service area in vendor selection. Examine billing plan parameters.	U,T,A	S,O,C,W,H
Device, Data Service Access	04CC-02-DSAD PCMCIA card, serial device, or USB device for access to on-line data services	Multiple protocols available such as General Packet Radio Service (GPRS), CDMA, TDMA. --- Consider coverage area. Examine billing plan parameters.	U,T,A	S,O,C,W,H
Paging	04CC-02-PAGE Paging services, 1-way text messaging	Audible or silent alarm --- Consider coverage area. Examine billing plan. Consider capacity (# of characters).	U,T,A	S,O,C,W,H

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CC - Commercial 03 - Satellite Phone				
Phone, Satellite Base	04CC-03-SATB Satellite communication device, fixed location	Operation similar to cell phone. Used in a fixed location. --- Difficult to receive calls. Line of sight to satellite (outside antenna) required.	U,T,A	S,O,C
Phone, Satellite Mobile	04CC-03-SATM Satellite communication device, mobile	Fixed or vehicle configuration. Cell-type service --- Line of sight to satellite (outside antenna) required.	U,T,A	S,O,C
Phone, Satellite Portable	04CC-03-SATP Satellite service with handheld device	Operation similar to cell phone. --- Difficult to receive calls. Line of sight to satellite (outside antenna) required. Service costs/fees.	U,T,A	S,O,C
CC - Commercial 04 - Satellite Data Services				
Equipment, Satellite Data	04CC-04-EQSD Satellite earth station transmitter and receiver, usually Ku-Band	Annual or multi-year leased capacity. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- 24x7x365 Availability. Fixed site (stationary and transportable). Two end points required. May require FCC license. Service costs questions should be directed to ODP.	U,T,A	S,O,C,W,H

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CC - Commercial 04 - Satellite Data Services - Continued				
INMARSAT - B	04CC-04-INST INMARSAT - B Satellite communications equipment	No license necessary. Similar to cell service. Monthly access charges with per minute charges. 64-Kbps channels. --- Line of sight to satellite (outside antenna) required. Supports video phone.	U,T,A	S,O,C
Services, Satellite Data	04CC-04-SADS Satellite Data Services (Internet access via satellite connection); Commercial providers of Internet connectivity via satellite	Stationary operation, transportable. Includes Ku (most often) and L band. --- Fixed site (stationary and transportable). Line of sight to satellite (outside antenna) required. Ka satellite service not readily available yet.	T,A	S,O,C
Services, Satellite, Brokered	04CC-04-SSBR Full service rental/lease of satellite transponder time, including truck and technicians	Purchase as needed. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- Fixed site (stationary and transportable). Two end points required. Very high bandwidth available.	A	S,O,C
Full Time Space Segment, Leased	04CC-04-SSFT Satellite transponder time purchased on long term contracts	Annual or multi-year leased capacity. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- 24x7x365 Availability. Fixed site (stationary and transportable). Two end points required. May require FCC license. Service costs questions should be directed to ODP.	A	S,O,C

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CC - Commercial 04 - Satellite Data Services - Continued				
Hourly Brokered Space Segment	04CC-04-SSHB Satellite transponder time purchased by the hour	Purchase as needed. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- Stationary site - Transportable Service. Two end points required. Service costs questions should be directed to ODP.	A	S,O,C
CP - Private 01 - Land-Mobile Radios & Bases				
Radio, Base	04CP-01-BASE Base radio system	Digital and Analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional and/or trunked systems. Project 25 compatible (if w/in 800 MHz). Project 25 required w/in 700MHz. --- See Standards List Number 55 for applicable standard.	U,T,A	S,O,C
Radio, Mobile	04CP-01-MOBL Mobile radio equipment, deployed on vehicles	Digital and Analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional and/or trunked systems. Project 25 compatible (if w/in 800 MHz). Project 25 required w/in 700MHz. --- See Standards List Number 55 for applicable standard.	U,T,A	S,O,C,W
Cable, Non-radiation Shielded Transmission	04CP-01-NRSC Non-radiation shielded transmission cable between base/repeater and antenna		T,A	S,O,C

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CP - Private 01 - Land-Mobile Radios & Bases - Continued				
Radio, Portable	04CP-01-PORT Individual/portable radio transceivers	Digital and Analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional systems. Project 25 compatible (if w/in 800 MHz). Project 25 required w/in 700MHz. --- See Standards List Number 55 for applicable standard.	U,T,A	S,O,C,W,H
Repeaters	04CP-01-REPT Repeaters	Digital or Analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional or trunked systems. Project 25 compatible (800 MHz). Project 25 required w/in 700MHz. Portable and/or Fixed. Able to pass encryption transparently. --- Could be configured for cross-band operations	T,A	S,O,C,W
CP - Private 02 - Interoperability Equipment				
Bridging/Patching	04CP-02-BRDG Bridging or patching equipment	Hardwired or Software definable. Connects multiple radios together at voice level. Supports 12 or more transmit/receive devices (radio, telephone, VoIP). --- Careful consideration must be given to how channels are interconnected.	T,A	S,O,C
CP - Private 03 - Other Land-Mobile Radio Equipment				
Amplifiers, Bi-directional	04CP-03-BAMP Bi-directional Amplifiers, application defined	Used to extend cell phone or radio signals into/out of buildings, tunnels, underground.	T,A	S,O,C,W

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CP - Private 03 - Other Land-Mobile Radio Equipment - Continued				
Radio, High Frequency (HF) Single Sideband	04CP-03-HFRQ High Frequency (HF) Single Sideband communications equipment	Deployable Antenna Systems. Automatic Link Establishment (ALE). Automatic Email option available. --- Long range communication. May require large antenna system (65 feet typical).	U,T,A	S,O,C
Radio, Microwave Link	04CP-03-MWAV Microwave Link for remote control of radio base stations or for temporary links at event sites.	May be either license-free or exclusive use license. --- Line of sight required. Available in licensed and un-licensed bands.	T,A	S,O,C
CP - Private 04 - Wide Area Networks				
Network, Wide Area Digital	04CP-04-WADN Wide area digital network, voice/data capable	>10MBPS data transmission speeds	U,T,A	S,O,C,W,H
CP - Private 05 - Wire-Line Communication				
Bridge, Audio Teleconferencing	04CP-05-BRAC Device to connect more than 2 parties (up to many dozens) into a single audio conference.		U,T,A	S,O,C
Exchange, Private Branch	04CP-05-LPBX Portable Private Branch Exchange (PBX)	Modern PBXs are VoIP platforms. --- Installation may be expedited by Telecommunications Service Prioritization (TSP) through state Emergency Management Office.	T,A	S,O,C

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Title	Item Number / Description	Features / Operating Considerations	Level[1]	Areas[2]
CP - Private 05 - Wire-Line Communication - Continued				
Bridge, Video Teleconferencing	04CP-05-VCNB Device to connect more than 4 parties (up to many dozens) into a single video conference.	May connect users via ISDN, Internet, dedicated broadband. May be encrypted. --- Extremely high price (>$100K)	A	S,O,C
Teleconferencing, Video	04CP-05-VCON Video teleconferencing over ISDN telephone lines or broadband facilities.	Minimum 256KB bi-directional bandwidth required.	U,T,A	S,O,C

1 End [U]ser, Comm [T]echnician, Comm [A]dvanced Technician
2 Rear Information Zone: [S]trategic. [O]perational; Forward Information Zone: [C]old, [W]arm, [H]ot

Overview

This section is structured to show detection equipment and recommended technologies based on both the type of expected hazard (Chemical, Biological, and Radiological) and anticipated mode of use (Portable, Transportable Lab Equipment, Fixed Site, and Standoff). It also includes a selection matrix that classifies each item by the recommended level of proficiency of the equipment operator versus the applicable hazard environment. Finally, the equipment list continues to annotate the capabilities of each detection device using three codes: **D** for **Detect**, **I** for **Identify**, and **Q** for **Quantify**.

The maturity and types of detection technology vary greatly depending on the level and type of hazard the user is detecting, and therefore the number and sophistication of the detection devices also varies greatly. Radiological detection devices have been commercially available and widely used for decades. Though the military has been using them since World War I, chemical detection devices (especially for traditional chemical warfare agents) have only recently been available to the civilian community. There are numerous types of chemical detection technologies, each of which has different characteristics and operating parameters. Biological warfare agent detection devices have only recently become commercially available, and new technologies continue to emerge.

New Sub-Section Headings for 2004

This section has been restructured to group detection items according to their likely mode of use. As in previous SEL editions, the major groupings are Chemical Detection and Support, Biological Detection and Support, and Radiological Detection and Support. Within these categories, the sub-categories used are:

- *Portable* - Equipment defined as being human portable for mobile operations in the field. The instrument is light enough to be carried by an emergency responder and operated by one individual.
- *Transportable Lab Equipment* - Equipment defined as being human portable for mobile operations in the field but generally requires a trained technical operator as well as extensive labor.
- *Fixed-Site Sampling or Detection Systems* - Equipment defined as stand-alone detection systems specifically designed to operate inside a building. The duration of operation for these instruments is indefinite, and the power requirements are met through the building infrastructure. Consumables required for continuous operation of the detection instruments would need to be provided by the building management (i.e., compressed gas cylinders).
- *Standoff Detector Systems* - Equipment specifically designed to monitor the presence of chemical agents that may be present in the atmosphere up to three miles away. These systems typically require one or two individuals for monitoring operations. Depending on the technique employed and the environmental conditions, these detectors can have high or low selectivity. Standoff detectors usually require vehicle transport and special setup.

Expanded Content

This year's section includes several new fields designed to assist readers in selecting appropriate equipment items:

- Standards - where possible, applicable standards are listed by providing a reference number that can be used to find the standard in the listing at the end of the SEL.
- Features - desirable characteristics or capabilities of the item

- Operating Considerations - other relevant information regarding the procurement or use of the specific item, such as safety issues, limitations, special characteristics, etc. Where possible, items are also assigned a category for estimating initial procurement costs, operating and maintenance costs, and required training level as described below.

As part of the Operating Considerations, a new feature has been added to assist the user in determining anticipated costs and training time required for each type of equipment. Rating scales were adopted by the Detection and Decontamination subgroup to quantify initial equipment costs, recurring operation and maintenance (O&M) costs, and amount of training required to become and remain proficient in the operation of the equipment. The initial cost was based on average cost of equipment that fit the category, including all necessary (but not extra) components. The O&M costs and training hours were based on estimated average annual requirements. The following scales were set.

Cost Scale (used for initial cost and yearly maintenance costs)

<$1K	$
$1-10K	$$
$10-50K	$$$
$50-100K	$$$$
>$100K	$$$$$

Training Scale (yearly requirement including initial training)

< 1 day	Minimal
1-2 days	Moderate
> 2 days (or requiring knowledge of chemistry, or biology, or recurring training more than once a month)	Extensive

Selection Matrix

Like most sections in the 2004 SEL, the Detection section includes a selection matrix to assist readers in quickly identifying appropriate equipment items. For the Detection section matrix, the Subgroup chose to use proficiency level and hazard environment as the rows and columns of its matrix.

The rows of the selection matrix represent proficiency level. In addition to any specific training required to operate an individual piece of equipment, the equipment operator must possess the skills necessary to meet the recommended proficiency level. The factors considered in determining this level include the anticipated location of operation of the equipment (i.e. hot zone, warm zone, or cold zone), the complexity of the equipment, and the necessity of chemical or biological training or expertise. Proficiency levels have been defined in accordance with NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents, as follows:

- **Awareness Level.** First responders at the awareness level are those persons who, in the course of their normal duties, can be the first on the scene of an emergency involving hazardous materials. First responders at the awareness level are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel, and secure the area.
- **Operational Level.** First responders at the operational level are those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. They should be trained to respond in a defensive fashion to control the release from a safe distance and keep it from spreading.

- **Technician Level.** Hazardous materials technicians are those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. Hazardous materials technicians are expected to use specialized chemical protective clothing and specialized control equipment.
- **Command Level.** The incident commander is that person who is responsible for all decisions relating to the management of the incident. The incident commander is in charge of the incident site.

One of these levels was modified slightly by the Subgroup for this publication. The Technician Level was changed to Technician/Specialist (the term "specialist" as used here should not be confused with the Private Sector Specialist definition in NFPA 472). A Specialist, for purposes of our matrix, was defined as an equipment operator that possessed extensive technical expertise, but did not possess emergency response HAZMAT experience or knowledge. Generally, a Specialist would be required for a piece of equipment defined as Transportable Lab Equipment.

The columns of the matrix represent the particular hazard environment(s) for which each item is suitable. The columns address the commonly used CBRNE nomenclature. However, for our purposes it is useful to represent the Nuclear "N" as part Thermal, part Explosive, and part Radiological. Therefore, the columns used for the SEL are:

- **Chemical**
- **Biological**
- **Radiological**
- **Nuclear**
- **Thermal**
- **Explosive**

Combining these two axes produces a selection matrix within which items can be categorized. In this printed version of the SEL, there will be areas entitled "Proficiency Level" and "Hazards" that will contain appropriate codes for each item. In the on-line version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a functional level and one or more threat/incident types.

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
BD - Biological Detection 01 - Portable					
Kit, Field Assay	05BD-01-KFAS Field assay kit. [D,I]	Handheld Portable --- Test results are presumptive Limited shelf life Requires temp-controlled storage Strict operating procedures For use with bulk material (visible) Not for environmental screening Limited number of agents Time sensitive Initial cost: $ Maintenance: $ Training: minimal		T	B
Kit, Protein Test	05BD-01-PTST Protein test kit. [D]	Handheld Portable --- Rules out non-biological Test results are presumptive Non-discriminatory between live or dead cells, harmless or harmful Reagents have limited shelf life For use with bulk material (visible) Initial cost: $ Maintenance: $ Training: minimal		T	B

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2 [A]wareness, [O]perations, [T]echnician/Specialist, [I]ncident Command
3 [C]hemical, [B]iological, [N]uclear, [T]hermal, [E]xplosive
** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
BD - Biological Detection 02 - Transportable Lab Equipment					
Analysis, DNA/RNA Detection	05BD-02-DNRN DNA/RNA detection analysis (example: PCR). [D,I,Q]	Detection limit about 100-200 CFU --- Test results are presumptive Reagent quality Proper sample preparation critical Does not discriminate between living and dead organisms Initial cost: $$$ Maintenance: $$ Training: extensive		T	B
BS - Biological Support 01 - Portable					
Kit, Biological Sampling/ evidence - Batch	05BS-01-KBBA Biological Sampling and Evidence Kit. Collects samples for later analysis.	Initial cost: $ Maintenance cost: $ Training: minimal		T	B
Sampler, Biological, Portable Air	05BS-01-KBPA Portable air sampler for biological sampling/ evidence.	Handheld Portable Air particulate only Collects sample for hand held assay analysis --- Variable air flow rate Shelf life consideration Filter: medium Initial cost: $$ Maintenance: $ Training: minimal		T	B

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3 [C]hemical, [B]iological, [N]uclear, [T]hermal, [E]xplosive
** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
BS - Biological Support 03 - Fixed-Site Sampling and/or Detection Systems					
Kit, Biological Sampling/ evidence - Automated perimeter sampling systems	05BS-03-KBAP Biological sampling/ evidence kit - automated perimeter sampling systems.	Building system mounted Vehicle mounted/carried Detects air particulates/aerosols only Collects discreet sample on filters --- Does not differentiate particle type Variable air flow rate Filter medium Initial cost: $$$ Maintenance: $ Training: minimal		O	B
CD - Chemical Detection 01 - Portable					
Detector, Flame Ionization (FID), Point, Chemical Agent	05CD-01-DPFI Flame Ionization Detector (FID), for point chemical agent detection. [D]	Handheld --- Non-specific Presence/absence Combustible fuel source (transportation may be an issue) Cannot be used in explosive atmospheres Initial cost: $$ Maintenance: $ Training: minimal		T	C
Detector, Flame Photometry, Point, Chemical Agent	05CD-01-DPFP Flame photometry detector for point chemical agent detection. [D,I,Q]	Detects nerve and blister --- Prone to false positives (anything containing sulphur and phosphorus) Initial cost: $$ Maintenance: $ Training: minimal		T	C

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 01 - Portable - Continued					
Detector, Photo-Ionization (PID), Point, Chemical Agent	05CD-01-DPPI Photo-Ionization Detector (PID) for point chemical agent detection. [D]	Handheld Fan or pump operated Variable pump speeds Intrinsically safe --- Non-selective Requires different sensor for different operations (O2, LEL/UEL) Requires calibration prior to each use Problems at high humidity and low temperatures Calibration gases require special transportation Shelf life dependent on type of sensor Ionization potential must be considered Initial cost: $$ Maintenance: $ Training: moderate		T	C
Detector, Spectrometry, Ion Mobility, Point, Chemical Agent	05CD-01-DPSI Ion mobility spectrometry detector for point chemical agent detection. [D]	Handheld Battery operated Moderate detection level Self-testing --- Optional wireless remote displays and data logging Readout indicates relative concentration, not actual measurement Non-selective Prone to false positives Internal radioactive source requires wipe test and NRC licensing Initial cost: $$ Maintenance: $$ Training: minimal		T	C

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 01 - Portable - Continued					
Detector, Surface Acoustic Wave, Point, Chemical Agent	05CD-01-DPSW Surface acoustic wave detector for point chemical agent detection. [D,I,Q]	Handheld Detects chemical warfare agents Moderate detection Moderate specificity --- Polymers and acoustic wave components subject to degradation over time Optional wireless remote displays and data logging Readout may indicate relative concentration or actual measurement Initial cost: $$ Maintenance: $ Training: minimal		T	C
Paper, Indicating	05CD-01-INPA Indicating paper. [D,I]	Handheld Will specify class of Chemical warfare agent (G, VX, H) Easy to use Response time: 30 seconds --- Liquid agent only Long shelf life Initial cost: $ Maintenance: N/A Training: minimal		O,T	C

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 01 - Portable - Continued					
Kit, Colormetric Tube/Chip	05CD-01-KCTC Colorimetric tube/chip kit specific for TICs and WMD applications. [D,I,Q]	Chemical specific User friendly --- Limited shelf life Wide variance in detection level Sensitive to humidity Initial cost: $$ Maintenance: $ Training: extensive	68,71	T	C
Kit, PCB Test	05CD-01-KPCB PCB test kit. [D, I, Q]	Regulatory detection level --- Limited shelf life Initial cost: $ Maintenance: $ Training: minimal		T	C
Kit, Mercury Test / Mercury Vapor Test	05CD-01-KTHG Mercury and mercury vapor test kit. [D]	Easy to use Moderate detection level --- Initial cost: $ Maintenance: $ Training: minimal		T	C
Kit, Chemical Agent Water Test	05CD-01-KWTR Chemical agent water test kit. [D]	Detects chemical agents in water Unspecified detection level --- Initial cost: $ Maintenance: $ Training: minimal		T	C

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Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 01 - Portable - Continued					
Kit, Waste Water Classifier	05CD-01-KWWC Waste water classifier kit. [D]	Easy to use Detects hydrocarbons, nitrates in water --- Initial cost: $ Maintenance: N/A Training: minimal		O	C
Kit, M-256 (A1)	05CD-01-M256 M-256(A1) Detection Kit for chemical agent (military grade: blister: CX/HD/L, blood: AC/CK and nerve: GB/VX) detection. [D, I]	Detects nerve, blood and blister agents Self-contained colormetric kit Instructions in case Response time: 15 -25 minutes Training kit available --- Detects presence/absence, not quantity Vapor only, except G agents Limited shelf life Initial cost: $ Maintenance: $ Training: moderate		T	C

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Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 02 - Transportable Lab Equipment					
Detector, Gas Chromatograph/Mass Spectrometer, Point, Chemical Agent	05CD-02-DPGC Gas chromatograph/mass spectrometer detector for point chemical agent detection. (GC/MS). [D,I,Q]	Identifies specific chemicals Quantifies amount of chemical present Portable Durable Response time: 5-15 minutes --- Climate sensitive High maintenance and recurring training Reagents and calibration requirements costly Initial cost: $$ Maintenance: $$ Training: extensive		T	C
Detector, Infrared, Point, Chemical Agent	05CD-02-DPIR Infrared (IR) detector for point chemical agent detection. [D,I,Q]	Detects in both liquid and solid samples --- Bulk material only Best results with dry samples Unstable at low temperatures No sample container Spectral interpretation necessary Initial cost: $$ Maintenance: $ Training: extensive		T	C
Kit, Chemical Classifying	05CD-02-KLSV Chemical classifying kit for unknown liquids, solids and vapors. [D,I]	Identifies classes of chemicals --- Requires constant refresher training, dedicated technician Initial cost: $$ Maintenance: $ Training: extensive		T	C

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CD - Chemical Detection 03 - Fixed-Site Sampling and/or Detection Systems					
Detector, Multi-gas Meter, Point, Chemical Agent	05CD-03-DPMG Multi-gas meter with minimum of O2 and LEL for point chemical agent detection. [D,I,Q]	4-5 gas meter Each sensor for different operation (O2, LEL/UEL, Cl2, CO, H2S, etc) Fan or pump operated --- Requires calibration prior to each use Calibration gases transportation issues Shelf life dependent on type of sensor Moderate sensitivity Initial cost: $$ Maintenance: $ Training: moderate		O,T	C
CD - Chemical Detection 04 - Standoff Detectors					
Detector, Stand-Off, Chemical	05CD-04-DCSO Stand-off chemical detector. [D, I]	Cold zone operations Detects to 5 km Vehicle mounted --- Sensitive to atmospheric conditions Gross level detector Requires line of sight Initial Cost: $$$ Maintenance: $$ Training: extensive		T	C

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
CS - Chemical Support 01 - Portable					
Kit, Air/Vapor Chemical Sampling	05CS-01-KAVC Air/vapor chemical sampling/evidence kit.	Initial cost: $ Maintenance: $ Training: minimal		T	C
Kit, Liquid Chemical Sampling	05CS-01-KLCS Liquid chemical sampling/evidence kit.	Initial cost: $ Maintenance: $ Training: minimal		T	C
Kit, Solid Chemical Sampling	05CS-01-KSCS Solid chemical sampling/ evidence kit.	Initial cost: $ Maintenance: $ Training: minimal		T	C
Kit, Chemical Sampling/ Evidence, Containment Vessels	05CS-01-KVES Chemical sampling/evidence kit, containment vessels.	Initial cost: $ Maintenance: $ Training: minimal		T	C
Detectors, Leak	05CS-01-LEAK Leak detectors (e.g., soap solution, ammonium hydroxide, ultrasonic, etc.)	Initial cost: $ Maintenance: $ Training: minimal		T	C
RD - Radiological Detection 01 - Portable					
Detector, High-Purity Germanium	05RD-01-DHPG High-purity germanium detector. [D,I,Q]	Portable handheld or laboratory fixed --- Considerable preparation time Liquid Nitrogen coolant required Limited battery life for portable units Calibration standards required Initial cost: $$$ Maintenance: $$ Training: extensive	61	T,I	R

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Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
RD - Radiological Detection 01 - Portable - Continued					
Dosimeters, Electronic	05RD-01-DOSE Electronic dosimeters. (ED) [D,Q]	Auto range (mR to R)/hour Small, lightweight Beta/Gamma detection Audible decibels --- Limited battery life Vibralert option Limited sensitivity Initial cost: $ Maintenance: $ Training: Minimal	62	A,O,T,I	R
Dosimeters, Personal	05RD-01-DOSP Personal dosimeters. (film or TLD) [D,Q]	Film type detects Gamma, X-Ray, and Neutron TLD also detects Beta Records total dose to wearer --- Not self-reading Temperature sensitive Service costs Initial cost: $ Maintenance: $ Training: minimal	63,110	A,O,T,I	R
Dosimeters, Self-Reading	05RD-01-DOSS Self-Reading Dosimeters (SRD) or Pocket Ionization Chambers (PIC). [D,Q]	Records total dose to wearer Detects Gamma only --- Shock sensitive Charging unit [battery operated & non-battery (piezoelectric)] Initial cost: $ Maintenance: $ Training: minimal	62	A,O,T,I	R

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
RD - Radiological Detection 01 - Portable - Continued					
Meters, Contamination, Handheld	05RD-01-HHCM Handheld contamination meters apha/beta, beta/gamma). [D,I,Q]	Multiple probes, mission dependent Various scales (CPM, mR, Sv) --- Limited battery life Calibration required Alpha mylar face prone to damage Initial cost: $ Maintenance: $ Training: moderate	63	O,T	R
"Detector", Personal Radiation (Gamma & Neutron)	05RD-01-PDGA Personal radiation "detector" gamma & neutron). [D]	Portable High sensitivity Response time: quick Detects Gamma and/or Neutron --- Initial cost: $ to $$ Maintenance: $ Training: minimal	62	A,O,T	R
RD - Radiological Detection 02 - Transportable Lab Equipment					
Spectrometer, Handheld (NaI or CZT) with Nuclide Identification	05RD-02-HHSP Handheld spectrometer, (NaI or CZT) with nuclide identification. [I,Q]	Fixed or portable Spectral Analysis Neutron detection capable --- Calibration required Limited battery life Temperature sensitive Initial cost: $$ Maintenance: $ Training: extensive	64	T	R

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3 [C]hemical, [B]iological, [N]uclear, [T]hermal, [E]xplosive
** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
RD - Radiological Detection 03 - Fixed-Site Sampling and/or Detection Systems					
Monitors, Portal	05RD-03-PMVP Portal monitors [vehicles, packages (large and small) and pedestrians]. [D]	Fixed or portable Gamma and Neutron detection --- Sensitivity requirements Initial cost: $$$ Maintenance: $$ Training: extensive	65	A,O,T	R
RS - Radiological Support 01 - Portable					
Equipment, Air Sampling	05RS-01-AFCB Air flow calibrators for samplers. Personal air sampler. Area air sampler (high volume).	Particulate collector Fixed or portable --- Outside analysis of filter medium: costly Initial cost: $ to $$ Maintenance: $ Training: moderate		T	R
RS - Radiological Support 02 - Plume Modeling					
Software, Plume Modeling	05RS-02-PLML Plume modeling software program that predicts travel of radiation materials. See also 03IT-07-PMOD	Web-based connectivity to reach back site On-site plume prediction --- Requires portable laptop Survey collection data Initial cost: $$ Maintenance: $ Training: extensive		T,I	R

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3 [C]hemical, [B]iological, [N]uclear, [T]hermal, [E]xplosive
** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Title	Item Number / Description *	Features / Operating Considerations	Standards[1]	Proficiency Level[2]	Hazards[3]
SE - Support Equipment 01 - Portable					
Sensor, Heat, Infrared	05SE-01-IHTS Infrared heat sensor.	Handheld or hands free High temperature sensitivity High quality resolution --- Waterproof Durable Limited battery life Initial cost: $$ Maintenance: $ Training: minimal		A,O,T	C,B,R
Thermometer, Surface	05SE-01-THMS Surface thermometer.	Handheld Accurate Precise Durable --- Initial cost: $ Maintenance: $ Training: minimal		T	C,B,R,T
SE - Support Equipment 03 - Fixed-Site Sampling and/or Detection Systems					
Equipment, Environmental (Weather) Surveillance	05SE-03-ENVS Environmental (weather) surveillance equipment to support CBRNE detectors.	Wind speed/direction Temperature Humidity Barometric pressure --- Fixed (vehicle mounted) or portable Information transfer Software interface Initial cost: $$ Maintenance: $ Training: minimal		A,O,T,I	C,B,R,T

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** Detector capabilities are annotated as [D]etect, [I]dentify, and [Q]uantify*

Overview

This section contains decontamination equipment, and is organized into three main categories, as follows:

- Pre-Decontamination, defined as activities or equipment that may be used prior to mass, emergency or technical decontamination.
- Active decontamination, defined as activities or equipment that may be used during mass, emergency or technical decontamination.
- Post-Decontamination, defined as activities or equipment that may be used after mass, emergency or technical decontamination.

Expanded Content

This year's section includes several new fields designed to assist readers in selecting appropriate equipment items:

- Standards - where possible, applicable standards are listed by providing a reference number that can be used to find the standard in the listing at the end of the SEL.
- Features - lists desirable characteristics or capabilities of the item.
- Operating Considerations - other relevant information regarding the procurement or use of the specific item, such as safety issues, limitations, special characteristics, etc. Where possible, an estimate of the required training level is also provided in this field.

Selection Matrix

Like most sections in the 2004 SEL, the Decontamination section includes a selection matrix to assist readers in quickly identifying appropriate equipment items. For the Decontamination section matrix, the Subgroup chose the same row and column headings used in the Detection Section (Section 5) - proficiency level for the rows, and hazard environment for the columns. Combining these two axes produces a selection matrix within which items can be categorized.

In this printed version of the SEL, there will be areas entitled "Proficiency Level" and "Hazards" that will contain appropriate codes for each item. Please see Section 5 for detailed definitions of the row and column values. In the on-line version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a functional level and one or more threat/incident types.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D1 - Pre-Decontamination 01 - Personal Decontamination Kits					
Kits or Packets, Personal Decontamination	06D1-01-KITD Kits or packets used for emergency personal decontamination.	Hand held Ability to self-decontaminate from chemical warfare agents. Ability to self-decontaminate from TIMs. Ability to self-decontaminate from biological agents. --- One time use Shelf life limitations Additional decontamination measures are required.		A,O,T	C,B
D1 - Pre-Decontamination 02 - Personal Decontamination Solutions					
Lotion, Reactive Skin Decontamination	06D1-02-RSDL Alternate solution to neutralize chemical warfare agents.	Easy to use --- Approved as a medical device only.	75	O,T	C
D1 - Pre-Decontamination 03 - Litters Extraction					
Litters, Extraction	06D1-03-LITR Rollable extraction litters	Man-portable Decontaminable Reusable Wheeled --- Uneven terrain Labor intensive Patient maximum weight considerations Storage/transport considerations Minimal training		A,O	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D1 - Pre-Decontamination 04 - Technical Decontamination Corridor Support					
Support, Decontamination Corridor	06D1-04-TDCS Signs, signals, traffic cones, lights, hazmat tape, directional signage, strobes, glow sticks, loudspeakers, etc.	Multiple pictures and languages Industrial grade GFI equipment --- Size Weight Deployment time Collapsible	81	O,T	C,B,R
D2 - Active Decontamination 01 - Emergency Decontamination - Systems					
Systems, Mass Casualty Decontamination	06D2-01-MCDS Mobile or fixed systems capable of delivering water or solutions in varying temperatures and at sufficient flow rates for the purpose of washing numerous contaminated victims. Suitable systems may be tents, trailers, vehicle mounted, or integrated into building systems.	Lighting HEPA filters Modesty protection Roller systems for dealing with non-ambulatory victims. --- Set up time Water supply Power supply		O,T	C,B,R

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D2 - Active Decontamination 02 - Emergency Decontamination Application Equipment					
Equipment, Emergency Decontamination Application	06D2-02-EDCS Equipment or system with the capability to immediately reduce contamination of individuals with potentially life threatening exposure with or without the formal establishment of a decontamination corridor.	Man-portable Freedom to select desirable solutions Low pressure Rapidly deployable Durable --- All weather Hazards of material Low cost Minimal training		O,T	C,B,R
D2 - Active Decontamination 03 - Waterproof Lighting					
Lighting, Decontamination Area	06D2-03-LITE Decontamination area lighting	Moisture resistance Brightness Decontaminable Portable --- Power supply Decontamination system compatible GFI Replacement bulbs Power cords	81	O,T	C,B,R
D2 - Active Decontamination 04 - Personal Property Tracking					
System, Personal Property Tracking	06D2-04-PPTS Personal property tracking system to identify personal effects of decontaminated victims.	Waterproof Attachable Writable --- Size		O,T	C,B,R

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D2 - Active Decontamination 05 - Technical Decontamination Equipment - Dry					
Equipment, Technical Decontamination - Dry	06D2-05-TDED Equipment used to decontaminate or remove dry materials.	Portable --- Requires power supply Collected material must be disposed of properly.		O,T	C,B
D2 - Active Decontamination 06 - Technical Decontamination Equipment - Wet					
Equipment, Technical Decontamination - Wet	06D2-06-TDEW Equipment used in the physical or chemical process of deliberate decontamination for responders and their equipment using liquids/solutions.	Pressure control for people/equipment Water/solutions Portable --- Climate Material identification Runoff control/waste water management		O,T	C,B,R
D2 - Active Decontamination 07 - Technical Decontamination - Shower Equipment					
Shower, Portable Decontamination	06D2-07-SHWR Unmanned framework designed to deliver water/decontamination solution at low pressure, low volume.	Stand alone Collapsible Rigged Unmanned Quick setup May be built-in systems --- Size Weight Drainage Water supply Deployment time		O,T	C,B,R,T

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D2 - Active Decontamination 08 - Technical Decontamination - Water Heater					
Heaters, Water, Transportable	06D2-08-HTRW Used to heat water for decontamination applications in the field.	Temperature regulation and gauge May have ability to induct and mix decontamination solutions with water. --- Inlet water pressure requirements and limitations. GPM output to meet application rate needed/fuel needed		O,T	C,B,R
D2 - Active Decontamination 09 - Technical Decontamination - Heater Equipment					
Heater, Portable Air Blower	06D2-09-HTRB Provides climate control for victims during necessary decontamination operations during inclement conditions.	Provides heating and/or drying --- Size Portability Power supply Temperature regulation Speed controls Collapsible		A,O,T,I	C,B,R

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D2 - Active Decontamination 10 - Decontamination Containment Devices					
Device, Liquid Decontamination Containment	06D2-10-LDCD Containment devices intended for use in the decontamination corridor for technical decontamination of equipment, people, and vehicles.	Portable Capture run off Non-porous Disposable Low enough for personnel to step into and out of. --- Various sizes Decontamination system dependent Material compatibility Larger inflatable or collapsible devices for vehicles will require ability to get vehicle into and out of device. Size may limit patient numbers before requiring pump-off capability.		O,T	C,B,R
D2 - Active Decontamination 11 - Waste Water Containment					
Drum, Waste Water Containment	06D2-11-WWCD Drums or bladder, for waste water containment and de-contamination shower waste collection, with intrinsically-safe evacuation pumps. To be used in conjunction with LDCD.	Various sizes Ability to hold large volumes of liquid hazardous waste product. Disposable or decontaminable --- Size Weight Transportation Storage Empty or full may require vehicles. Pump capability	58, 81	O,T	C,B,R

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2 [A]wareness, [O]perations, [T]echnician/Specialist, [I]ncident Command
3 [C]hemical, [B]iological, [R]adiological, [T]hermal, [E]xplosive

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Level[2]	Hazards[3]
D3 - Post-Decontamination 01 - Disposable Blankets					
Blankets, Disposable	06D3-01-BLKT Disposable blankets	Low cost Compact storage Durable --- One time use		A,O,T	C,B,R,T,E
D3 - Post-Decontamination 02 - Disposable Modesty Clothing					
Clothing, Disposable Modesty	06D3-02-CLOM Disposable modesty clothing, with footwear; adult and child sizes.	Compact storage Durable Various sizes Instructions for use should be in multiple languages and/or pictures. --- Modesty shelter No shelf life limitations Low cost		O,T	C,B,R
D3 - Post-Decontamination 03 - Bags					
Bags, Cadaver, Non-transparent	06D3-03-BCNT Non-transparent cadaver bags See also 07MS-00-BAGB	Disposable Ability to be carried --- Universal precautions may be required. Low cost Staffing extensive		O,T	C,B,R,T,E

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2 [A]wareness, [O]perations, [T]echnician/Specialist, [I]ncident Command
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Overview

The Medical SubGroup provides guidance regarding health and medical aspects of local, state, and federal standardization, interoperability, and responder safety to prepare for, respond to, mitigate, and recover from any incident by identifying requirements for WMD incident response equipment.

Items in this section are divided into 3 categories:

- Medical Equipment: durable medical equipment
- Medical Supplies: single use, disposable, and generally inexpensive (<$100 per item)
- Pharmaceuticals: medications and fluids

Logistical equipment required to support medical operations (but not directly related to patient care or medical support of personnel) can be located in other appropriate SEL sections such as Operational Equipment, Communications, and Power.

Edits and Additions

The following item changes were made to the 2004 SEL version:

Added:

- CANA Auto Injector
- Hemostatic Bandages
- Medication/Supply Climate Control Device (refrigerator)

Modified:

- MK1 Kit modified to official name "Nerve Agent Antidote Kit (NAAK)" with a specific reference to MK1 in the description

In addition to specific item changes, the entire section has been augmented to provide information on standards and operating considerations. Most items were modified to include specific standards references, including specific citations of FDA regulations and the OSHA blood borne pathogen standard where applicable. The majority of items also include notes on features and operating limitations. These notes provide practical advice on product selection and utilization.

Selection Matrix

The Medical Items matrix used in the previous version of the SEL has been modified to align more closely with the manner in which clinical services are provided. The new matrix is composed of specific functional levels within the continuum of the EMS/Clinical Care delivery system (rows) versus CBRNE threats/incidents (columns). The specific row categories used in the matrix are:

Basic Life Support (BLS)	BLS as defined by the standard national BLS curricula and routinely carried on BLS EMS response resources.
Advanced Life Support (ALS)	ALS as defined by the standard national ALS curricula and routinely carried on ALS EMS response resources.
Pre-Hospital Mass Casualty	Items needed specifically to manage pre-hospital mass casualty events but that may not routinely be used by pre-hospital care organizations or carried on BLS/ALS response resources.
Hospital	Items routinely used in the hospital environment.
Disaster	Items that should be stockpiled for mass casualty/disaster response situations.

The columns of the matrix represent the particular hazard environment(s) for which each item is suitable. The columns address the commonly used CBRNE nomenclature. However, for our purposes it is useful to represent the Nuclear "N" as part Thermal, part Explosive, and part Radiological. Therefore, the columns used for the SEL are:

- **Chemical**
- **Biological**
- **Radiological**
- **Nuclear**
- **Thermal**
- **Explosive**

Combining these two axes produces a selection matrix within which items can be categorized. If an item is considered 'standard equipment' within a particular area of the EMS/Clinical Care delivery system, it is included in all the columns for that area. In this printed version of the SEL, there will be areas entitled "Functional Levels" and "Threat/Incident Type" that will contain appropriate codes for each item. In the on-line version of the SEL implemented in the Responder Knowledge Base (www.rkb.mipt.org), users will be able to search for SEL items interactively by choosing a functional level and one or more threat/incident types.

Using the SEL Medical Section

The IAB Medical SubGroup would also like each organization to carefully consider the full range of issues inherent to the procurement of equipment, pharmaceuticals, and supplies. Though the SEL makes recommendations, each community must assess their individual needs and capabilities, and should modify the recommendations to suit their particular threats, weaknesses, and standards of care. This SEL section provides some initial guidance to assist local, state, and federal response organizations as they develop the medical aspects of their response plans. Local and/or state medical authorities must be involved in adapting this list for use in various jurisdictions, and for developing protocols governing use of the items on the list.

In addition to the considerations outlined previously, the Medical SubGroup also encourages each organization to evaluate the following factors as they develop response plans and purchase SEL items in support of those plans:

- Consider the environmental factors for pharmaceuticals and some medical supplies. Adulteration can occur quickly in climatic extremes.

- Consider and plan for the custom batteries/power systems that will be required for most medical diagnostic and monitoring equipment.
- Do comprehensive 'power planning' to look at the power needs of your total response capability. Pay particular attention to the combination of monitoring/diagnostic equipment and environmental factors such as climate control, lighting, refrigeration, and information equipment/computer support.
- Be aware that certain supplies are considered regulated for bulk transportation. If you are moving large amounts of material (especially applicable to the Disaster and Hospital sections of the matrix), consult with a transportation/hazmat professional.
- Don't forget to incorporate Federal resources such as the PEP Pods, SNS, and Chempack program into your local planning process.
- When selecting durable medical equipment as well as monitoring and diagnostic equipment, consider the needs of durability, appropriateness for field use, and whether the item is disposable or decontaminable.
- Remember to budget for the routine maintenance of monitoring and diagnostic equipment as specified by the manufacturers.

Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment					
Equipment, Administrative	07ME-00-ADMN All inclusive administrative and durable office support equipment to sustain medical branch operations.	Consider caching this type of equipment in portable vessels/containers to facilitate rapid mobilization and/or relocation. Consider wireless and satellite connectivity for computer-rated products. See also 07MS-00-ADMIN.		B,A,P,H,D	C,B,R,T,E
Equipment, Airway Management	07ME-00-AWMG Durable airway management equipment, basic and advanced. Enables basic and advanced access to, and protection of, patient respiratory system.	Consider products impervious to infectious fluids; adult and pediatric applications. See also 07MS-00-AWMG and 07MS-00-OXYA.	1	B,A,P,H,D	C,B,R,T,E
Bag/Kit/Pack, Medical	07ME-00-BAGM Portable vessel that contains various medical supplies and equipment.	Consider products impervious to infectious fluids; products equipped with reflective surfaces to enable rapid visualization; size versus storage limitations. Consider products that are lightweight and durable.		B,A,P,H,D	C,B,R,T,E
Equipment, Blood Pressure	07ME-00-BPSL Manual and automated blood pressure equipment/products.	Consider products impervious to infectious fluids and/or disposable adjuncts; various size applications, including adult and pediatric applications; power needs and battery life on automated units.	8	B,A,P,H,D	C,B,R,T,E
Equipment, Training/ Casualty Simulation	07ME-00-CSIM Life-like human body replicas that enable medical practitioners to train in various scenarios.	Consider adult and pediatric applications; ease of cleaning; ease of assembly and disassembly; storage requirements; battery life (as applicable). Consider disposal of accessories and adjuncts (and related costs).		B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment - Continued					
Defibrillator, Automated External	07ME-00-DEAE Simple device that enables rapid application, automated assessment, and (when necessary) delivery of corrective electrical impulse for lethal cardiac dysrythmias. Use of device by practitioners with minimum or no training.	Consider ease of use for practitioners with minimal or no training. Consider products with clear, concise voice prompts; products with automated data storage and download features; products providing interoperability with advanced cardio/ defibrillation devices. Consider adult/pediatric applications; weight and storage requirements; disposal cost of adjuncts/ electrodes. These devices require special batteries supplied by manufacturers. Note battery life and need for electrical recharging units during protracted incidents.	7,11	B,A,P,H,D	C,B,R,T,E
Defibrillator/Cardiac Monitors/Pacing	07ME-00-DEMP Advanced cardiac monitoring/defibrillation/ pacing devices for use by practitioners with advanced medical training.	Consider interoperability with devices both less and more complex. Consider devices equipped with automated dysrythmia recognition and related alarm features; devices with clear & concise voice prompts; weight and storage requirements; cost of disposal of adjuncts/electrodes. Consider devices engineered to accommodate both basic and advanced trained practitioners. These devices require special batteries supplied by manufacturers. Note battery life and need for electrical recharging units during protracted incidents.	10,11	A,P,H,D	C,B,R,T,E
Meters, Glucose	07ME-00-GLUM Simple device that rapidly analyzes blood glucose levels from capillary blood sample.	Devices should provide rapid analysis with minimal operator interface. Consider infection control and related maintenance; costs of strips and related supplies. Select products that self-calibrate or require minimal operator interface calibration, and utilize commercial over the counter batteries. Disposable items may require replacement during protracted incident.	2	B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment - Continued					
MCI Organizational Equipment/Kits	07ME-00-MCIK Fully equipped kits that contain all equipment and materials to coordinate multicasualty incidents, including (but not limited to) triage tags/supplies, clip boards and related forms, color coded marking tape and tarps for treatment areas, medical branch position vests; field operation guide (FOG) for medical branch/MCI operations and local protocols.	Consider containers/vessels impervious to infectious fluids; products with reflective surfaces for ease of visualization. See also 07MS-00-TTAG.		B,A,P,H,D	C,B,R,T,E
Otoscope/Ophthalmoscope	07ME-00-OTOP Otoscope/Ophthalmoscope	Consider devices with commercial over the counter batteries. Disposable items may require replacement during protracted incident.	13,41	H,D	C,B,R,T,E
Equipment, Oxygen	07ME-00-OXYE Durable oxygen equipment (e.g., cylinders, regulators, manifolds, etc.) to facilitate the storage and delivery of medical oxygen.	All equipment should be lightweight and easily stored in the intended usage environment. All devices should be intrinsically safe relative to high pressures and flammability. Consider infectious control and related maintenance issues, and impact resistance features of gauges and other vulnerable impact points.	73,74,76	B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment - Continued					
Oximeter, Pulse	07ME-00-POXI Non-invasive device that monitors oxygen saturation levels in blood.	Minimal training required to apply. --- Consider devices constructed as features built into other devices (EKG monitors, etc.). Consider durability of probes; disposable probe accessories and/or infection control and related maintenance issues. Device cases should be impervious to infectious fluids. Certain toxic exposures, as well as environmental conditions, can lead to inaccurate readings. Consider devices with commercial over the counter batteries; disposable items may require replacement during protracted incident.	9	B,A,P,H,D	C,B,R,T,E
Refrigerator	07ME-00-RFGR Device for maintaining temperature control (cooling) for pharmaceutical and other medical equipment.	Battery and generator capabilities		H,D	C,B,R,T,E
Shelter, Medical	07ME-00-SHEL Easy to assemble structure to provide temporary shelter for patients and medical practitioners. Constructed of lightweight frame and/or inflatable.	Structures should be lightweight and easy to assemble with minimal personnel; surfaces should be extremely durable and impervious to infectious fluids. Consider products with multiple access/egress points; products equipped with ventilation features; products that offer optional heating/cooling climate control features; products that offer optional decontamination features; logistical storage and transportation requirements. Consider appropriateness for operating environment.		P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment - Continued					
Equipment, Spinal Immobilization	07ME-00-SPIN Adjuncts that enable spinal immobilization of patients from all types of positions and environments.	All products should be impervious to infectious fluids. Consider all types of patients sizes and weights. Head immobilization features should enable easy access to patient airway. Products should be lightweight and easily transportable. Consider storage requirements; application in confined space/entrapment environments; horizontal and vertical rescue requirements including movement up and down stairwells and other minimal space environments. Consider products that enable interoperability with other rescue equipment (gurneys, litters, stokes, etc.). Also consider length and width limitations of transport vehicles (ambulances, helicopters, boats, carts, all-terrain vehicles, etc). See also 07MS-00-SPIN		B,A,P,H,D	C,B,R,T,E
Splints, durable	07ME-00-SPLT Splints that enable all types of limb immobilization. All types and sizes.	Durable devices should be impervious to infectious fluids. Consider disposable products; all size requirements (including adult and pediatric); storage and transport requirements. Products should be easy to use with minimal training, and should be easy to apply in various rescue environments, including confined space and entrapment rescues. Products should offer interoperability with other medical equipment and rescue devices (backboards, litters, gurneys, etc). See also 07MS-00-SPLT.	17,18	B,A,P,H,D	C,B,R,T,E
Stethoscope	07ME-00-STET Durable stethoscope to assist in patient care through audible assessments (auscultation). Durable and disposal models available.	All products should be impervious to infectious fluids. Consider audible-assist features (Doppler) for high noise environments. Price vary greatly - consider replacement costs. Consider acquisition of large quantity of disposable units for MCI/DMAT/USAR deployments.	3	B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment - Continued					
Equipment, Suction Units	07ME-00-SUCT Negative pressure devices that enable suctioning of patient airway. Airway maintenance device. Various models, both powered and manually operated.	All devices, including carrying/storage cases, should be impervious to infectious fluids. Consider ease of use and disposability of collection vessels, tubing, and related supplies. Products should be easy to use with minimal training; Consider products with adjustable pressure settings; adult and pediatric applications; storage and transport requirements; battery life and related replacement costs. For powered units 12 volt mobile, apparatus-based power and/or hand-operated power sources need to be considered. See also 07MS-00-SUCT.	21	B,A,P,H,D	C,B,R,T,E
Thermometer	07ME-00-THER Devices that enable assessment of patient temperature.	All devices and carrying cases should be impervious to infectious fluids. Consider disposable adjuncts that contact patient surfaces/fluids. Devices should be easy to use with minimal training, and offer large display features. Consider devices built-in as features to other medical devices (EKG monitors, etc.). Should use commercial over the counter batteries; disposable items may require replacement during protracted incident.	24,25,26	B,A,P,H,D	B,T
Ventilators	07ME-00-VENT Positive pressure ventilators that deliver regulated volumes of oxygen to patients requiring invasive respiratory support. Adult and pediatric applications.	Battery powered and pressure controlled devices available. --- All devices and carrying cases should be impervious to infectious fluids and should offer adjustable rate and tidal volumes. Consider adult and pediatric applications; disposable adjuncts and related costs; storage and transport requirements. Devices should be easy to use with minimal training, and offer both audible and visual over-pressure alarms. Device requires special batteries supplied by manufacturers; Note battery life and need for electrical recharging units during protracted incidents. See also 07MS-00-VENT.	5	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
ME - Medical Equipment 01 - Patient Movement Devices					
Cots	07ME-01-COTS Portable, lightweight structures that are easily assembled to accommodate patients in supine position. Typically used in shelter operations.	All structures and related materials should be impervious to infectious fluids. Consider infection control and related maintenance issues; interoperability with other medical equipment (backboards, etc.); storage and transport requirements. Consider products that are lightweight and easy to assemble with minimal personnel. Consider all types of patient sizes/weights.	39,40	B,A,P,H,D	C,B,R,T,E
Gurneys	07ME-01-GURN Portable patient movement devices. Adjustable positions both vertical and horizontal. Durable medical equipment.	All devices and related accessories should be impervious to infectious fluids. Consider products ease of use with minimal training; full range of vertical and horizontal position adjustments; operations in confined space environments including ascent and descent of stairwells, around corners and other confined spaces. Consider optional accessories to accommodate equipment storage including oxygen, EKG monitors, IV poles, and other surface areas and storage capabilities. Consider operational body mechanics required for all sizes of practitioners; maintenance requirements and related costs; interoperability with other medical equipment (backboards, splints, etc.) and interoperability with various transport vehicles (ambulances, helicopters, boats, carts, all-terrain vehicles, etc.). Consider weight rating requirements. Consider wheel locks and other desirable safety devices.	40	B,A,P,H,D	C,B,R,T,E
Litters/Stretchers	07ME-01-LITR Variable-position patient transport devices.	Stokes baskets considered in this category should be rugged and impact resistant; all surfaces and related accessories should be impervious to infectious fluids. Consider interoperability with other medical equipment (backboards, splints, etc); storage and transport requirements. See also 07ME-01-GURN.	39	B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies					
Supplies, Administrative	07MS-00-ADMN All inclusive administrative and non-durable office support supplies to sustain medical branch operations.	Various supplies including but not limited to paper, pens/ pencils, markers, fastening supplies/devices, files, folders, etc. Consider caching this category of equipment in portable vessels/containers to facilitate rapid mobilization and/or relocation. See also 07ME-00-ADMIN		B,A,P,H,D	C,B,R,T,E
Pads, Alcohol Prep	07MS-00-ALPP Single-use alcohol prep pad to cleanse patient skin surface.	Disposable medical supply, single-use application. Consider skin sensitivity and use near open wounds.		B,A,P,H,D	C,B,R,T,E
Supplies, Airway Management	07MS-00-AWMG Airway management supplies, basic & advanced. Enables basic and advanced access to, and protection of, patient respiratory system. Non-durable supplies	Consider all single-use, disposal products; adult and pediatric applications. See also 07ME-00-AWMG, 07MS-00-OXYA and 07MS-00-SUCT.	1	B,A,P,H,D	C,B,R,T,E
Bag, Body, Heavy-Duty	07MS-00-BAGB Single-use body bag to contain deceased patients. See also 06D3-03-BCNT.	Single-use, rugged, non-transparent surface; should be impervious to fluids and should contain all bodily fluids within the assembly without leakage. Consider infectious control requirements.		B,A,P,H,D	C,B,R,T,E
Bag, Biohazard	07MS-00-BAGH Variable size, disposable bags to contain materials soiled with infectious fluids/products.	Consider various size requirements; bag thickness and durability; multi-lingual label requirements. Products should be conspicuously colored and labeled with biohazard insignias. Consider products with zip-closures and other ease-of-use features.		B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Bandages and Dressings	07MS-00-BAND Variable size, disposable bandages and dressing to treat all types of soft tissue wounds. Non-durable absorbent products.	Consider surface texture requirements for various applications; specialty dressings for burn care, all size requirements; adhesive and non-adhesive requirements. Sterile products should be individually packaged; other non-sterile products can be packaged in bulk.	23	B,A,P,H,D	C,B,R,T,E
Supplies, Biohazard Disposal	07MS-00-BIOD Various non-durable vessels to contain and manage materials soiled with biohazards.	Consider various size requirements; product surface thickness and durability; multi-lingual label requirements; products with non-spill openings and other ease-of-use features. Products should be conspicuously colored and labeled with biohazard insignias.		B,A,P,H,D	C,B,R,T,E
Block, Bite	07MS-00-BITE Disposable device designed for insertion between patient's teeth. Respiratory maintenance device.	Consider potential damage to patient's teeth and other potential airway complications caused from use of this product. Consider adult and pediatric applications; disposable, single-use assembly; individually packaged.	14	B,A,P,H,D	C,B,R,T,E
Supplies, Disinfectant	07MS-00-DSIN Commercial disinfectant products to clean skin and other surfaces.	Consider product decontamination features; packaging and application features; storage requirements. Consider various usage applications (human skin versus work surfaces).	38	B,A,P,H,D	C,B,R,T,E
Gloves, Biomedical, Non-Sterile	07MS-00-GLVN Variable size, single-use examination gloves. Disposable, non-latex. Non-sterile.	Consider all size requirements to accommodate practitioners; skin sensitivity; product thickness and durability; textured surfaces for ease of handling instruments. Products should be ambidextrous. See also 07MS-00-GLVS for sterile gloves.	34,98	B,A,P,H,D	C,B,R,T,E
Gloves, Biomedical, Sterile	07MS-00-GLVS Variable size, sterile biomedical gloves.	See also 07MS-00-GLVN for non-sterile gloves.	20	H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Bandages, Hemostatic	07MS-00-HSBN Sterile bandages coated or impregnated with substances that enhance suppression of active bleeding.			B,A,P,H,D	E
Supplies, Personal Hygiene	07MS-00-HYGP Various skin disinfectant and hygiene supplies.	Consider skin sensitivity when selecting products. Consider desired application versus product use features and limitations. All products should be single-use, disposable, and individually packaged.		B,A,P,H,D	C,B,R,T,E
Supplies, Body Substance Isolation	07MS-00-ISOS Body substance isolation supplies (masks, gowns, eye protection). Various isolation barriers to protect practitioners from exposure to infectious substances.	Consider all size requirements to accommodate practitioners, and skin sensitivity. All products should be impervious to infectious fluids/substances. Consider single-use, disposable products; anyl non-disposable equipment such as eye protection should be easy to clean/disinfect. Consider storage and transport requirements.	19,43,46	B,A,P,H,D	C,B,R,T,E
Bag, Intravenous Pressure Infusion	07MS-00-IVBG Pressure infusion device for use with intravenous solution bags to expedite fluid delivery.	Consider size requirements for intended applications. All product surfaces should be impervious to infectious substances and puncture resistant.	30	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Supplies, Intravenous Admin	07MS-00-IVSA Various intravenous solutions and needle/ catheter assemblies.	Consider all size/gauge requirements for various applications; all required solution types based upon protocol standards; safety requirements including safety needles and needleless assemblies/systems and any required adapters and conversion accessories. Consider systems that offer ease of use with minimal training, and interoperability with other medical devices/applications. Consider storage and transport require-ments. Products should be individually packaged; solutions are perishable.	27,28,31, 43	A,P,H,D	C,B,R,T,E
Linens	07MS-00-LNEN Disposable and non-disposable linen products.	Consider disposable products to minimize storage and handling of materials soiled with infectious substances. Consider maintenance and storage requirements, and related costs for non-disposable products; product durability; product absorption characteristics.	43	A,P,H,D	C,B,R,T,E
Supplies, Medication Administration	07MS-00-MEDS Various disposable and non-disposable supplies to facilitate the administration of medications.	All supplies should be disposable or impervious to infectious substances. Consider all size requirements; interoperability requirements with needless systems; necessary adapters to enable interoperability; storage and transport requirements.	22,32	B,A,P,H,D	C,B,R,T,E
Tubes, Nasogastric	07MS-00-NATU Single-use, disposable gastric tube.	Consider all size/gauge requirements, including adult and pediatric applications; interoperability and any required adapters; storage and transport requirements. All products are single-use, disposable, and should be individually packaged.	15	A,P,H,D	C,B,R,T,E
Needles, Assorted	07MS-00-NEAG Various size/gauge needles to draw fluids and/or administer medications.	Consider all size/gauge requirements for intended uses; needles with safety mechanisms for use in direct patient administration; interoperability with needleless system and any required adapters; storage and transport requirements for various sizes and quantities. All products should be individually packaged.	22	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Nebulizer, all types	07MS-00-NEBU Nebulizer assembly to facilitate the administration of mistified medications and solutions.	All products should be single-use, disposable; individually packaged; easy to assemble with minimal training. Consider any required adapters to enable interoperability with other medication components. See also 07MS-00-AWMG.	4	B,A,P,H,D	C,B,R,T,E
Needles, Intraosseous Infusion	07MS-00-NEIO Various size/gauges to facilitate intravenous fluid access and fluid/medication administration.	Engineered with safety devices to minimize practitioner needle stick injuries. --- Consider all sizes/gauges required for the prescribed treatment interventions; interoperability with needleless systems and any required adapters; storage and transport required to accommodate various sizes and quantities. Products should be individually packaged.	43	A,P,H,D	C,B,R,T,E
Supplies, Oxygen Administration	07MS-00-OXYA Oxygen administration supplies, basic and advanced. Enables basic and advanced access to, and protection of, patient respiratory system. Non-durable supplies.	Consider all single-use, disposal products; adult and pediatric applications. See also 07ME-00-AWMG and 07MS-00AWMG.	1	B,A,P,H,D	C,B,R,T,E
Brush, Povodine	07MS-00-POBR Antiseptic brush saturated with Povodine to cleanse skin surface area.	Consider skin sensitivity; storage and transport requirements. Products should be individually packaged. Perishable product.		A,P,H,D	C,B,R,T,E
Solutions and Applicators, Povodine Iodine	07MS-00-POVO Various brushes and swabs saturated with Povodine to cleanse skin surface area.	Consider skin sensitivity; various size requirements; storage and transport requirements. Products should be individually packaged. Perishable product.		H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Electrodes/Probes, Monitoring	07MS-00-PROB Self-adhesive electrodes to facilitate electrical monitoring. Single-use, disposable.	Consider adult and pediatric applications; lead requirements for appropriate packaging quantities; diaphoretic tolerant products. Perishable product.	42	A,P,H,D	C,B,R,T,E
Supplies/Systems, Patient Restraint	07MS-00-REST Multi-use patient restraints and systems; easy to apply with minimal training (including limb and torso restraints).	Products should be disposable or impervious to infectious substances. Consider ease of use with minimal training; ease of connectivity; interoperability with various medical devices including gurneys, litters, backboards, etc.; storage and transport requirements.	36	B,A,P,H,D	C,B,R,T,E
Shears/Scissors, Medical	07MS-00-SHER Standard medical shears to enable cutting of various materials.	Consider blunt tip requirements; size and strength requirements for various applications; storage and transport requirements.	37	B,A,P,H,D	C,B,R,T,E
Shield, Eye Irrigation Lens	07MS-00-SHEY Single-use, disposable eye lens with catheter to facilitate irrigation.	Consider various size requirements; port connectivity requirements. Products should be individually packaged.		B,A,P,H,D	C,B,R,T,E
Supplies, Spinal Immobilization	07MS-00-SPIN Various devices (e.g., cervical collars, head immobilizers) to immobilize/stabilize the neck and spinal region.	Consider all types of patient sizes including adult and pediatric applications. Products should be single-use, disposable and/or impervious to infectious substances; consider ease of use with minimal training; ease of application in confined spaces and other entrapment environments; storage and transport requirements. All carrying cases should be impervious to infectious substances. See also 07ME-00-SPIN.		B,A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Splints, Disposable	07MS-00-SPLT Splints that enable all types of limb immobilization. All types and sizes.	Products should be ease to use with minimal training. Products should be ease to apply in various rescue environments including confined space and entrapment rescues; should offer interoperability with other medical equipment and rescue devices (backboards, litters, gurneys, etc.). Consider storage and transport requirements. See also 07ME-00-SPLT.	17,18,43	B,A,P,H,D	C,B,R,T,E
Supplies and Adjuncts, Suction	07MS-00-SUCT Catheters, tubing, wands and miscellaneous connection devices for use with suction devices.	All products should be single-use, disposable; consider connectivity requirements with various ports and interoperability with other medical devices and airway equipment. See also 07ME-00-SUCT and 07MS-00-AWMG.	35,43	B,A,P,H,D	C,B,R,T,E
Suture, Various Sizes	07MS-00-SUTR Various size absorbable and non-absorbable suture kits and supportive supplies to treat soft tissue injuries.	Consider all injury size and types; all products should be single-use, disposable. See also 07MS-00-SUTS.	16	H,D	C,B,R,T,E
Supplies and materials, Suture	07MS-00-SUTS Single-use, disposable supplies to support suturing procedures.	See also 07MS-00-SUTR.	16	H,D	C,B,R,T,E
Syringe, Cartridge Injector	07MS-00-SYRC Plastic assembly that facilitates syringe use.	Consider all size requirements; products should be impervious to infectious substances and/or single-use disposable; consider ease of use with minimal training.	12,43	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies - Continued					
Syringe	07MS-00-SYRG Various size syringes, with and without built-in needles. For use in drawing and administering medications and solutions. Also used in injection and aspiration of air from some airway devices.	Consider various size/gauge requirements; consider needless systems and interoperability requirements and any necessary adapters; consider products engineered with needle safety systems.	32,43	A,P,H,D	C,B,R,T,E
Tape, Adhesive	07MS-00-TAAS Various size adhesive medical tape.	Consider skin sensitivity; consider length and width requirements; consider absorption qualities for desired application; consider storage and transport requirements to support a selection of various size products.	29	B,A,P,H,D	C,B,R,T,E
Depressor, Tongue	07MS-00-TNDP Single-use, disposable device used for oral assessment.	Single-use, disposable; consider alternate uses.	33	B,A,P,H,D	C,B,R,T,E
Tags and supplies, Triage	07MS-00-TTAG Single-use, disposable patient marking device for use during multicasualty triage management.	Consider simple device compatible with standard triage protocol; self-connecting to patient; packaged and stored in bulk. See also 07ME-00-MCIK.		B,A,P,H,D	C,B,R,T,E
Ventilator, Disposable	07MS-00-VENT Positive pressure ventilators that deliver regulated volumes of oxygen to patients requiring invasive respiratory support. Adult and pediatric applications.	All devices and carrying cases should be impervious to infectious fluids. Pressure controlled devices. Consider devices that enable adjustable rate and tidal volumes; consider adult and pediatric applications. Devices should be ease to use with minimal training. Consider devices that offer both audible and visual over-pressure alarms; consider storage and transport requirements. See also 07ME-00-VENT.	6	P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
MS - Medical Supplies 01 - Kits					
Kit, Debridement, and Supplies	07MS-01-KDEB Single-use, disposable kit to clean soft tissue injuries and surfaces.	Kits should be self-contained, single-use, disposable.		H,D	C,B,R,T,E
Kit, Obstetrical	07MS-01-KTOB Self-contained kit with supplies required to support obstetrical procedures.	Consider products that are single-use, disposable, self-contained; consider storage and transport requirements.		B,A,P,H,D	C,B,R,T,E
Kit, Thoracostomy and Supplies	07MS-01-THOR Self contained kit to perform and support chest decompression.	All products should be single-use, disposable; consider all needle size requirements; consider all necessary adapters and interoperability requirements.	22	H,D	C,B,R,T,E
PH - Pharmaceuticals					
Adenosine	07PH-00-ADEN Anti-dysrhythmic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Albuterol	07PH-00-ALBU Bronchodilator	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Amiodarone	07PH-00-AMIO Anti-dysrhythmic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Amyl Nitrite	07PH-00-AMNI Vasodilator	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C
Antacids	07PH-00-ANTA Antacid	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Acetylsalicylic Acid	07PH-00-ASA Anticoagulant; analgesic, anti-inflammatory; fever reduction.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Atropine Sulfate	07PH-00-ATSF Antidote for organophosphate and nerve agent exposure.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Ipratropium	07PH-00-ATVT Bronchodilator	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Beclomethasone	07PH-00-BCLM Steroid, oral inhalant or nasal spray for respiratory disorders.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Bismuth Products	07PH-00-BISM Anti-emetic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Calcium Chloride	07PH-00-CACL Electrolyte used in resuscitation settings.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Calcium Gluconate	07PH-00-CALG Electrolyte used in acute cases for hyperkalemia, hypocalcaemia, or calcium antagonist overdose. Also used in making a slurry for hydrogen fluoride burns.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
CANA Auto-Injector	07PH-00-CANA Valium packaged in an auto-injector.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	B,A,P,H,D	C,B,R,T,E
Charcoal, Activated	07PH-00-CHAR Used in emergency setting to treat oral ingestion poisoning/overdoses.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	B,A,P,H,D	C,B,R,T,E
Cyanide Antidote Kit	07PH-00-CYKT Typical kit includes Sodium Nitrite, Sodium Thiosulfate and Amyl Nitrite inhalant.	Consider all dosage requirements; consider all contraindications and side effects; perishable product. Note shelf life of individual components.	75	A,P,H,D	C
Dextrose	07PH-00-DEXT Glucose compound for use in hypoglycemia.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	B,A,P,H,D	C,B,R,T,E
Diazepam	07PH-00-DIAZ Anticonvulsant	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Diphenhydramine	07PH-00-DIPH Antihistamine	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Dopamine	07PH-00-DOPA Used in emergency setting to treat acute hypotension.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Diethylenetriaminepenta-acetic Acid	07PH-00-DPTA Used in emergency setting for hypertension.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Electrolyte Replacement Fluid, Oral	07PH-00-ELEC Crystalloid solutions for fluid replacement (oral).	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	C,B,R,T,E
Epinephrine, Auto-Injector	07PH-00-EPIA Epinephrine packaged in auto-injector	Consider all dosage requirements; consider all contraindications and side effects; perishable product. Pediatric and Adult versions available.	75	B,A,P	C,B,R,T,E
Epinephrine	07PH-00-EPIP Catecholamine, used in cardiac arrest, as a vasoconstrictor acute hypotension, as a bronchodilator and antispasmodic in bronchial asthma.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Fosphenytoin	07PH-00-FOSP Anticonvulsant	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Furosemide	07PH-00-FURO Diuretic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Glucagon	07PH-00-GLUC Anti-hypoglycemia agent.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Gransetron	07PH-00-GRAN Antinauseant and antiemetic.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	R
Lidocaine, all concentrations	07PH-00-LIDO Anti-dysrhythmic as well as analgesic properties.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Loperamide	07PH-00-LOPE Antidiarrheal agent	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Lorazepam	07PH-00-LORA Sedative; antianxiety agent; benzodiaphine.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Nerve Agent Antidote Kit (NAAK)	07PH-00-M1AI Commonly known as Mark 1 Kit (AutoInjector) Pralidoxime chloride autoinjector - 2-PAM; Atropine autoinjector.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	B,A,P,H,D	C
Magnesium Sulfate	07PH-00-MASU Electrolyte replacement, anticonvulsant, bronchodialator.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Methylene Blue	07PH-00-METB Used in emergency setting for hemoglobinopathies.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C
Methylprednisolone	07PH-00-METP Corticosteroid; bronchodilation and anti-inflammatory characteristics.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Midazolam	07PH-00-MZLM Sedative; anticonvulsant, benzodazapine.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Nitroglycerin	07PH-00-NTRO Nitrate; vasodilator and smooth muscle relaxant.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Oxygen	07PH-00-OXYG Oxygen	Consider all dosage requirements; consider all contraindications and side effects; product stored under pressure; product supports combustion; consider storage and transport requirements, including safety considerations.	75	B,A,P,H,D	C,B,R,T,E
Phenergan	07PH-00-PHNG Antiemetic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Phenytoin	07PH-00-PHNT Anti-convulsant	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Potassium Iodide	07PH-00-POTI Used in radiation emergency - protects the thyroid in a radiation emergency.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	R
Pralidoxime Chloride	07PH-00-PRAL Used in nerve agent and organophosphate exposures; Component of nerve agent antidote kit (NAAK).	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Prussian Blue	07PH-00-PRUS Used in emergency setting for radiation exposures. Radioactive cesium and thallium, whether ingested or inhaled, will end up in the intestines. Prussian blue traps these materials in the intestines and keeps them from being absorbed by the body. The radioactive materials then move through the intestines and are excreted in bowel movements.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	R
Ribavirin	07PH-00-RIBA Ribavirin is used in combination with interferon for the treatment of Hepatitis C. This medication is also used to treat severe lung infections caused by respiratory syncytial virus.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B
Rimantadine	07PH-00-RIMA Rimantadine is used to prevent and treat infections caused by influenza A virus.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B
Ringers Solution, Lactated	07PH-00-RING Crystalloid solution used for fluid replacement.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals - Continued					
Saline Solution	07PH-00-SALI Crystalloid solution used for fluid replacement. May also be used for topical irrigation.	Consider all dosage requirements; consider all contraindications and side effects; perishable product. Product may also be used as topical irrigation solution.	75	B,A,P,H,D	C,B,R,T,E
Silver Sulfadiazine Cream	07PH-00-SISU Silver sulfadiazine, a sulfa drug, is used to prevent and treat infections of second and third-degree burns.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,R,T,E
Sodium Bicarbonate	07PH-00-SOBI Sodium bicarbonate is an electrolyte sometimes used in resuscitation, crush syndrome, or overdoses; used in acute acid-base imbalance in cardiac arrest.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Sodium Thiosulfate	07PH-00-SOTH Used in the treatment of cyanide or arsenic poisoning; a typical component of cyanide antidote kits.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C
Tetracaine Ophthalmic	07PH-00-TCOP Ophthalmic anesthetic for use in eye injuries.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E

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PH - Pharmaceuticals - Continued					
Theophylline	07PH-00-THEO Bronchodilator; Theophylline is used to prevent and treat wheezing, shortness of breath, and difficulty breathing caused by asthma, chronic bronchitis, emphysema, and other lung diseases.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Thiamine	07PH-00-THIA Thiamine is a vitamin used by the body to break down sugars in the diet. The medication helps correct nerve and heart problems.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Water, Sterile	07PH-00-WATR Fluid solution; topical irrigation or oral consumption.	Consider usage requirements including any contraindications and side effects.	75	B,A,P,H,D	C,B,R,T,E
PH - Pharmaceuticals 01 - Analgesics					
Acetaminophen	07PH-01-ACET Analgesic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Ibuprofen	07PH-01-IBUP Nonsteroidal anti-inflammatory agent; analgesic.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals 01 - Analgesics - Continued					
Ketorolac	07PH-01-KETO Nonsteroidal anti-inflammatory agent; analgesic.	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
PH - Pharmaceuticals 02 - Antibiotics/Antibacterical Agents					
Amoxicillin	07PH-02-AMOX Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	B
Chloramphenicol	07PH-02-CHLO Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B
Ciprofloxacin	07PH-02-CPRO Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	B
Doxycycline	07PH-02-DOXY Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	B
Erythromycin	07PH-02-ERYT Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	P,H,D	B
Gentamicin	07PH-02-GENT Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B
Polysporin Ointment	07PH-02-POLY Antibiotic ointment	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Streptomycin	07PH-02-STMY Antibiotic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B

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Title	Item Number / Description	Features / Operating Considerations	Standards[1]	Missions[2]	Hazards[3]
PH - Pharmaceuticals 02 - Antibiotics/Antibacterical Agents - Continued					
Trimethoprim/ Sulfamethoxazole	07PH-02-TRIM Antibacterial agent	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	B
PH - Pharmaceuticals 03 - Narcotics/Narcotic Antagonists					
Butorphanol Injection	07PH-03-BUTO Narcotic analgesic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	H,D	C,B,R,T,E
Morphine Sulfate	07PH-03-MOSU Narcotic analgesic	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E
Naloxone	07PH-03-NALX Narcotic antagonist	Consider all dosage requirements; consider all contraindications and side effects; perishable product.	75	A,P,H,D	C,B,R,T,E

1 Use numbers given to refer to Standards List at the end of this document.
2 [B]asic Life Support, [A]dvanced Life Support, [P]re-Hospital Mass Casualty, [H]ospital, [D]isaster
3 [C]hemical, [B]iological, [R]adiological, [T]hermal, [E]xplosive

Overview

Previous editions of the SEL included multiple references to batteries and generators throughout the various sections. This section was created to eliminate that redundancy and remind readers that power is a significant consideration in planning across all areas. It includes only three sections: Batteries and Power Cells, Generators, and Other Power-Related Equipment. However, its elevation to a separate section should increase awareness of power requirements as the number and type of electronic equipment items increase in virtually every section of the SEL. Readers are encouraged to look across the applicable items in other SEL sections, and consider the requirements for batteries (number, type, service life, shelf life, etc.), generators, power filtering equipment, and other power-related items without which critical equipment will cease to function. Where applicable, comments regarding the need for special power requirement such as custom batteries will be noted in the Operating Considerations field of equipment in other SEL sections.

No selection matrix has been provided for this section. The applicability of the power requirement will be determined by the type and location of the equipment items being powered.

Title	Item Number / Description	Features / Operating Considerations
BC - Batteries and Power Cells		
Batteries, All Types, Sizes	08BC-00-BATT Batteries for all recommended equipment. Types including, but not limited: to Alkaline, Nickel-Cadmium (NICAD), Nickel Metal Hydride (NiMH), Lithium (Li-Ion). Form factors such as: AA, AAA, C and D cells, 9-Volt, Clamshell.	Disposable or rechargeable Intrinsically safe batteries required for explosive environments --- Shelf life Recharge time if applicable
Cell, Fuel	08BC-00-FCEL Fuel Cells	
Charger	08BC-00-SOLR Including but not limited to: solar, natural gas, shore power, etc.	
GE - Generators		
Generator	08GE-00-GENR Generators, varying types and sizes, including gasoline, diesel, alternater and gas turbine powered devices.	Portable or fixed --- Examine load capacity Regular testing Automatic transfer switch
PE - Other Power-Related Equipment		
Conditioners, Battery	08PE-00-BCON Battery Conditioners	
System, Power Conditioning	08PE-00-PCDS Surge supression	
Switch, Power Transfer	08PE-00-PTSW Switch for power output transfer to support generator maintenance and fueling.	Employable with generator autostart for continuous operation and uninterrupted power flow.
Supply, Uninterruptible Power (UPS)	08PE-00-UPS Uninterruptible Power Supply (UPS)	Consider load/time relation.

Overview

This section has been created to simplify access to reference documents that were previously included under Operational Equipment. All references have now been classified as either "Field Expedient References" or "References", with the former category highlighting those items that would be useful to carry to the scene of an incident.

SEL Item Numbers are not used in displaying the references - they are provided in alphabetical order by title. Where possible, author, International Standard Book Number (ISBN), and edition information are provided. This year's SEL also provides comments on applicability and utility of specific references.

Selection Matrix

This section also has a selection matrix, which will be available only in the on-line version of the SEL. The PP&OE Subgroup has classified each of the references using the Mission Role definitions from Section 1, and the Hazard Environment definitions from Section 2. The result is a somewhat simpler matrix than the full Hazard/Mission Matrix used in Section 1, and the intention is to allow selection of recommended references by detailed mission role (patrol officer, firefighter, hazmat technician, etc.) and general hazard environment (Chemical, Biological, etc.). See Sections 1 and 2 for the specific definitions used.

Title	Description	Features / Operating Considerations
FR - Field Expedient References		
CHRIS Manual	Author: USCG	Resource Scene Reference --- Quantity of chemicals discussed. Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development. Particularly suited for toxic industrial chemicals. Does not address military agents.
Effects of Exposure to Toxic Gases; First Aid and Medical Treatment	Author: Matheson ISBN: 9994698605	Limited descriptions of toxicological mechanisms --- Quantity of chemicals discussed. Reference resource during preplanning, training, and exercise development.
Emergency Action Guides	Author: Association of American Railroads	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Emergency Care for Hazardous Materials Exposure	Author: Bronstein, Currance ISBN: 801678137 Edition: 2nd Pages: 635	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Emergency Handling of Hazardous Materials in Surface Transportation	Author: Association of American Railroads ISBN: 9990687005	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
EPA Recognition and Management of Pesticide Poisoning	Author: Morgan ISBN: 0912702818	Descriptions of toxicological mechanisms. --- Used for preplanning, training, and exercise development.
Farm Chemicals Handbook	Author: Meister ISBN: 9990801061 Edition: 2002	Resource Scene Reference --- Quantity of chemicals discussed. Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.

Title	Description	Features / Operating Considerations
FR - Field Expedient References - Continued		
Gardner's Chemical Synonyms and Trade Names	Author: Milne ISBN: 566082195 Edition: 11th	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
GATX Tank Car Manual	Author: GATX	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Genium's Handbook of Safety, Health, and Environmental Data	McGraw ISBN: 0071341439	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Handbook of Toxic and Hazardous Chemicals and Carcinogens	Author: Sittig, Pohanish ISBN: 081551459X Edition: 4th Pages: 2,300	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Hawley's Condensed Chemical Dictionary	Author: Lewis, Hawley ISBN: 471387355 Edition: 14th Pages: 1,300	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Hazardous Chemicals Desk Reference	Author: Lewis, Richard J. ISBN: 0471441651	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Hazardous Material Injuries	Author: Stuz	Descriptions of toxicological mechanisms.

Title	Description	Features / Operating Considerations
FR - Field Expedient References - Continued		
Hazardous Materials Field Guide	Delmar Publishing Author: Bevelacqua, Stilp ISBN: 766801551 Edition: 1st Pages: 96	Resource Scene Reference --- Quantity of chemicals discussed. Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Hazardous Materials Managing the Incident - FOG	Author: Noll, Hildebrand, Yvorra Field operations guide	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Jane's Chemical/Biological Handbook	Author: Sidell ISBN 710619235 Pages: 298	Overviews all of the primary military, chemical and biological materials. Includes differential diagnosis tools for agent identification.
Management of Chemical Warfare Casualties	Author: Sidell, DOD	Descriptions of toxicological mechanisms. Field quick reference for treatment of patients
Matheson Gas Data Book	Author: Matheson	Detailed data on chemical gases. --- Detailed towards industrial gases. Suitable for reference at the scene of an incident and during preplanning, training, or exercise development.
Medical Management of Biological Casualties Handbook	Author: DOD	Descriptions of toxicological mechanisms caused by biological hazard.
Medical Management of Chemical Casualties Handbook	Author: DOD	Descriptions of toxicological mechanisms caused by chemical weapons.
Medical Management of Radiological Casualties Handbook	Author: DOD ISBN: 1931828237 Edition: 1st Edition Pages: 133	Descriptions of toxicological mechanisms caused by radiological hazards.

Title	Description	Features / Operating Considerations
FR - Field Expedient References - Continued		
Merck Index	Author: Chapman, Hall ISBN: 412128217 Edition: 12th	Resource scene reference for chemical hazards of technical nature. --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
North American Emergency Response Guidebook	Author: U.S. Department of Transportation ISBN: 066017992X Edition: 2000	Resource Scene Reference --- Details of chemicals discussed. Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Pocket Guide for Industrial Chemicals	Author: National Institute for Occupational Safety and Health	Excellent quick reference for toxic industrial chemicals. Also available in electronic version.
Quick Selection Guide to Chemical Protective Clothing	Author: Forsberg, Mausdorf ISBN: 471287970 Edition: 3rd Pages: 124	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Sax's Dangerous Properties of Industrial Materials	Author: Lewis, Richard J. ISBN: 0471354074	Resource Scene Reference for chemical hazards. --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
Symbol Seeker, Hazard Identification Manual, International Edition	Author: IFTSA Edition: International Edition	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
TLVs and BEIs Guidebook	Author: ACGIH	Resource Scene Reference --- Quantity of chemicals discussed. Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.

Title	Description	Features / Operating Considerations
RD - Reference Database		
Gloves Plus	Author: Keith, Lawrence ISBN: 873717104 Pages: 26	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
NIOSH Guide to Chemical Hazards (Electronic)	CDC/NIOSH - Electronic version of the pocket guide.	Free for download from http://www.cdc.gov/NIOSH. See publications and databases. Lists physical, chemical and toxicological properties of TICs.
Tomes Plus/Chemical Knowledge Database	Author: Micro Medix Pages: CD-ROM	Resource Scene Reference --- Suitable for reference at the scene of an incident and as a reference resource during preplanning, training, and exercise development.
RE - References		
Air Monitoring Instrumentation: A Manual for Emergency Investigatory and Remedial Responders	Author: Maslansky, Carol J. and Maslansky, Steven P. ISBN: 0471284602	Used for preplanning, training and exercise development.
Clinical Management of Poisoning and Drug Overdose	Author: Olson ISBN: 0838502601	Descriptions of toxicological mechanisms. --- Used for preplanning, training and exercise development.
Clinical Toxicology of Commercial Products	Author: Gosselin ISBN: 683036327 Edition: 5th Edition	Descriptions of toxicological mechanisms of TICs. --- Detail of mechanisms somewhat limited. Reference resource during preplanning. Used for training Hazardous Materials Technicians.
Common Sense Approach to Hazardous Materials	Author: Fire, Frank L.	Textbook dealing with the chemistry and effects of hazardous chemicals and radiation.

Title	Description	Features / Operating Considerations
RE - References - Continued		
Emergency Medical Response to Hazardous Materials	Delmar Publishing Author: Bevelacqua, Stilp ISBN: 827378297 Edition: 1st Pages: 522	Descriptions of toxicological mechanisms for the field medical technician --- Limitations due to the level of deployment, based upon protocol which the field medical technician can function. Reference resource during training. Used for training Hazardous Materials Technicians.
First Responder's Guide to Agricultural Chemicals Accidents	Author: Foden-Weddell ISBN: 873717996 Pages: 540	Descriptions of toxicological mechanisms for the field medical technician --- Limitations due to the level of deployment agricultural chemicals, based upon protocol which the field medical technician can function. Reference resource during training. Used for training Hazardous Materials Technicians.
Handbook of Medical Toxicology	Viccellio ISBN: 0316902470	Descriptions of toxicological mechanisms. --- Used for preplanning, training, and exercise development.
Hazardous Materials Chemistry	Delmar Publishing Author: Bevelacqua ISBN: 766814343 Edition: 1st Edition Pages: 192	Basic chemical nomenclature for the responder. Textbook. --- Detailed chemical mechanisms are not discussed. Reference resource during training. Used for training Hazardous Materials Technicians.
Hazardous Materials Managing the Incident	Author: Noll, Hildebrand, Yvorra ISBN: 0879391111	Overviews the management of hazardous materials incidents. Primarily a learning text. --- Suitable for preplanning, training, and exercise development.
HazMat Air Monitoring and Detection Devices	Hawley ISBN: 0766807274	Used for preplanning, training and exercise development.
Household Chemicals and Emergency First Aid	Author: Foden, Weddell ISBN: 873719018 Pages: 448	Descriptions of toxicological episodes. --- Limited towards the level of description. Household chemicals only. Reference resource during training. Used for training Hazardous Materials Technicians.

Title	Description	Features / Operating Considerations
RE - References - Continued		
Jane's Facility Security Handbook	Author: Kozlow, Sullivan ISBN: 710622880 Pages: 320	Descriptions of primary planning issues. --- Direction with organizational structures. Reference resource during preplanning, training, and exercise development.
Joint Information Center (JIC) Manual		Descriptions of primary planning issues --- Used at strategic level operations. Reference resource during preplanning, training, and exercise development.
Mass Casualty and High Impact Incidents - An Operations Guide	Author: Christen, Henry T. and Maniscalco, Paul M. ISBN: 0-13-099222-4	Reference for planning and training.
Special Operations of Terrorism and HazMat Crimes,	Author: Hawley, Noll, Hildebrand	Used for preplanning, training and exercise development.
Street Smart HazMat Response	Callan	Used for preplanning, training and exercise development.
Tempest CB FRG (Chem Bio) First Responder Guidebook		Descriptions of military generated chemicals --- Quantity of chemicals discussed. Reference resource during preplanning and exercise development.
Tempest Chem Bio Frequently Asked Questions (CB FAQ)	Author: Graves ISBN: 966543718 Edition: 1st Pages: 175	Descriptions of military generated chemicals. Questions and answers. --- Quantity of chemicals discussed. Reference resource during preplanning and exercise development.
Terrorism Handbook for Operational Responders	Delmar Publishing Author: Bevelacqua, Stilp ISBN: 766804755 Edition: 1st Edition Pages: 110	Reference for planning, and training

Title	Description	Features / Operating Considerations
RE - References - Continued		
Terrorism Response: Field Guide for Law Enforcement	Author: Christen, Henry T. and Maniscalco, Paul M. ISBN: 0-13-110747-X	Reference for planning and training.
Terrorism Response: Field Guide for Fire and EMS Organizations	Author: Christen, Henry T. and Maniscalco, Paul M. ISBN: 0-13-110906-5	Reference for planning and training.
Transport of Radiological Materials; Q&A About Incident Response	Author: Berga, Byrd, et al	General discussion on radiological chemicals. --- Level of information discussed. Reference resource during preplanning, training, and exercise development.
Understanding Terrorism and Managing the Consequences	Author: Christen, Henry T. and Maniscalco, Paul M. ISBN: 0-13-021229-6	Used for preplanning, training and exercise development.

The list on the following pages is referenced by item number from multiple sections of the SEL. In addition to its number, each item on the list has two annotations:

- Type, which will be either ***Adopted*** or "R" for Reference Only. Adopted standards are those that have been formally adopted by the IAB (see discussion in the Standards Coordinating Committee section of the 2003 IAB Annual Report). All other standards are included for reference only.
- Use/Care, which distinguishes standards for the use and care of personal protective equipment, as opposed to product certification standards. Such standards will be identified by "yes" in the Use/Care column,

Each standard in this list also has a corresponding record in the Responder Knowledge Base (www.rkb.mipt.org). The online records contain a summary description of the standard, the promulgating organization, and one or more links through which the standard may be viewed or purchased.

Sorted Number	Standard Name	Type[1]	Use/Care[2]
1	21 CFR (Several Standards apply) FDA. Local standards for EMS and facility patient management equipment should be used.	R	
2	21 CFR 862.1345 (FDA), Glucose test system	R	
3	21 CFR 868.1930 (FDA), Stethoscope head	R	
4	21 CFR 868.5630 (FDA), Nebulizer	R	
5	21 CFR 868.5895 (FDA), Continuous ventilator	R	
6	21 CFR 868.5915 (FDA), Manual emergency ventilator	R	
7	21 CFR 870.1025 (FDA), Arrhythmia detector and alarm	R	
8	21 CFR 870.1120 (FDA), Blood pressure cuff	R	
9	21 CFR 870.2700 (FDA), Oximeter	R	
10	21 CFR 870.2800 (FDA), Medical magnetic tape recorder	R	
11	21 CFR 870.5300 (FDA), DC-defibrillator (including paddles)	R	
12	21 CFR 872.6770 (FDA), Cartridge syringe	R	
13	21 CFR 874.4770 (FDA), Otoscope	R	
14	21 CFR 876.1500 (FDA), Endoscope and accessories	R	
15	21 CFR 876.5980 (FDA), Gastrointestinal tube and accessories	R	
16	21 CFR 878 (FDA) (multiple sections apply)	R	
17	21 CFR 878.3900 (FDA), Inflatable	R	
18	21 CFR 878.3910 (FDA), Non-inflatable	R	
19	21 CFR 878.4040 (FDA), Surgical apparel	R	
20	21 CFR 878.4460 (FDA), Surgeon's glove	R	
21	21 CFR 878.4780 (FDA), Powered suction pump	R	
22	21 CFR 878.4800 (FDA), Manual surgical instrument for general use	R	
23	21 CFR 880 (FDA) (multiple sections apply)	R	
24	21 CFR 880.2900 (FDA), Colormetric	R	
25	21 CFR 880.2910 (FDA), Electronic	R	
26	21 CFR 880.2920 (FDA), Mercury	R	
27	21 CFR 880.5025 (FDA), IV Bag Container	R	
28	21 CFR 880.5200 (FDA), IV Catheter	R	
29	21 CFR 880.5240 (FDA), Medical adhesive tape and adhesive bandage	R	
30	21 CFR 880.5420 (FDA), Pressure infusor for an I.V. bag	R	
31	21 CFR 880.5440 (FDA), Administration Set (All Components)	R	

[1] *IAB Adopted Standard, or [R]eference Only Standard*
[2] *"Yes" indicates standard for the use or care of personal protective equipment - not a certification standard.*

Sorted Number	Standard Name	Type[1]	Use/Care[2]
32	21 CFR 880.5860 (FDA), Piston syringe	R	
33	21 CFR 880.6230 (FDA), Tongue depressor	R	
34	21 CFR 880.6250 (FDA), Patient examination glove	R	
35	21 CFR 880.6740 (FDA), Vacuum-powered body fluid suction apparatus	R	
36	21 CFR 880.6760 (FDA), Protective restraint	R	
37	21 CFR 880.6820 (FDA), Medical disposable scissors	R	
38	21 CFR 880.6880 (FDA), Steam sterilizer	R	
39	21 CFR 880.6900 (FDA), Hand-carried stretcher	R	
40	21 CFR 880.6910 (FDA), Wheeled stretcher	R	
41	21 CFR 886.1570 (FDA), Ophthalmoscope	R	
42	21 CFR 898 (FDA), Performance Standard for Electrode Lead Wires and Patient Cables	R	
43	29 CFR 1910.1030 (OSHA), Bloodborne Pathogens	R	
44	29 CFR 1910.120 (OSHA), Hazardous waste operations and emergency response.	R	Yes
45	29 CFR 1910.132 (OSHA), General requirements, PPE	R	Yes
46	29 CFR 1910.134 (OSHA), Respiratory Protection	R	Yes
47	29 CFR 1910.135 (OSHA), Head Protection	R	Yes
48	29 CFR 1910.138 (OSHA), Hand Protection	R	Yes
49	29 CFR 1910.147 (OSHA) The Control of Hazardous Energy (Lockout/Tagout)	R	
50	40 CFR 264 (EPA), Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	R	
51	42 CFR 84 (NIOSH), Respiratory Protective Devices	R	
52	42 CFR 84 (NIOSH), with Air-Purifying Escape Respirator/Self-Contained Escape Respirator CBRN Statement of Standard; NPPTL Letter dated October 8, 2003	***Adopted***	
53	42 CFR 84 (NIOSH), with APR CBRN Statement of Standard; NPPTL Letter dated April 4, 2003	***Adopted***	
54	42 CFR 84 (NIOSH), with SCBA CBRN Statement of Standard; NPPTL Letter dated December 28, 2001	***Adopted***	
55	47 CFR 90 (FCC), Private Land Mobile Radio Services	R	
56	49 CFR 172.101 (DOT) Purpose and use of hazardous materials table.	R	
57	49 CFR 173 (DOT), General Requirements for Shipments and Packages	R	Yes
58	49 CFR 173.3 (DOT), Packaging and Exceptions	R	Yes
59	49 CFR 178, Specifications for Packagings	R	Yes
60	Advanced Encryption Standard (AES), Data Encryption Standard (DES), and Triple Data Encryption (3-DES) (NIST)	R	
61	ANSI N42.14, Calibration and Use of Germanium Detectors for the Measurement of Gamma-Ray Emission Rates of Radionuclides.	R	
62	ANSI N42.32, Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security	R	
63	ANSI N42.33, Portable Radiation Detection Instrumentation for Homeland Security	R	

[1] *IAB Adopted Standard, or [R]eference Only Standard*

[2] *"Yes" indicates standard for the use or care of personal protective equipment - not a certification standard.*

Sorted Number	Standard Name	Type[1]	Use/Care[2]
64	ANSI N42.34, Performance Criteria for Hand-held Instruments for the Detection and Identification of Radionuclides	R	
65	ANSI N42.35, Evaluation and Performance of Radiation Detection Portal Monitors for Use in Homeland Security	R	
66	ANSI Z87.1 Occupational and Educational Personal Eye and Face Protection Devices	R	
67	ANSI Z89.1, Industrial Head Protection	***Adopted***	
68	ANSI/ISEA 102-1990, Gas Detector Tube Units - Short-Term Type for Toxic Gases and Vapors in Working Environments	R	
69	ANSI/ISEA 105, Hand Protection Selection Criteria	***Adopted***	
70	ANSI/ISEA 107, High Visibility Safety Apparel	***Adopted***	
71	ASTM D4490, Measuring the Concentration of Toxic Gases or Vapors Using Detector Tubes	R	
72	ASTM F1052-97, Standard Test Method for Pressure Testing Vapor Protective Ensembles	R	Yes
73	E-4 Edition: 4 Standard for Gas Pressure Regulators	R	
74	E-7 Edition: 2 Standard for Medical Gas Regulators and Flowmeters	R	
75	Federal Food, Drug and Cosmetic Act	R	
76	G-4.1 Edition: 5 Cleaning Equipment for Oxygen Service	R	
77	Global Justice XML Data Model (DOJ)	R	
78	National Institute for Justice (NIJ) and the Department for Homeland Security (DHS) are currently funding the development of an NIJ Standard for bomb suits. This standards development process is being managed by the NIST-Office for Law Enforcement Standards (OLES). The requirement for a bomb suit standard was generated by the IAB PP&OE Subgroup. The U.S. military has developed the Operational Requirements Document (ORD) for Explosive Ordnance Disposal Advanced Bomb Suit (ABS). The U.S. military has also generated a draft Performance Specification, Bomb Suit, Advanced. The lead organization for this class of military protective equipment development is the Army Natick Soldier Center.	R	
79	NFPA 10, Standard for Portable Fire Extinguishers, 2002 Edition	R	
80	NFPA 30, Flammable and Combustible Liquids Code	R	
81	NFPA 70, National Electric Code	R	
82	NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 edition	R	Yes
83	NFPA 1581, Standard on Fire Department Infection Control Program, 2000 Edition	R	Yes
84	NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles	R	Yes
85	NFPA 1852, Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus, 2002 Edition	R	Yes
86	NFPA 1951, Standard on Protective Ensemble for USAR Operations, 2001 Edition	***Adopted***	
87	NFPA 1971, Standard on Protective Ensemble for Structural Fire Fighting, 2000 Edition	***Adopted***	
88	NFPA 1975, Standard on Station/Work Uniforms for Fire and Emergency Services, 2004 Edition	***Adopted***	

[1] *IAB Adopted Standard, or [R]eference Only Standard*

[2] *"Yes" indicates standard for the use or care of personal protective equipment - not a certification standard.*

Sorted Number	Standard Name	Type[1]	Use/Care[2]
89	NFPA 1976, Standard on Protective Ensemble for Proximity Fire Fighting, 2000 Edition	***Adopted***	
90	NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus, 2002 Edition	***Adopted***	
91	NFPA 1982, Standard on Personal Alert Safety Systems, 1998 Edition	***Adopted***	
92	NFPA 1983, Standard on Fire Service Life Safety Rope and System Components, 2001 Edition	***Adopted***	
93	NFPA 1991, Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies, 2000 Edition	***Adopted***	
94	NFPA 1992, Standard on Liquid Splash-Protective Clothing for Hazardous Materials Emergencies, 2000 Edition	***Adopted***	
95	NFPA 1994, Standard on Protective Ensembles for Chemical/ Biological Terrorism Incidents, 2001 Edition (Class 1 Requirements)	***Adopted***	
96	NFPA 1994, Standard on Protective Ensembles for Chemical/ Biological Terrorism Incidents, 2001 Edition (Class 2 Requirements)	***Adopted***	
97	NFPA 1994, Standard on Protective Ensembles for Chemical/ Biological Terrorism Incidents, 2001 Edition (Class 3 Requirements)	***Adopted***	
98	NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations, 2003 Edition	***Adopted***	
99	NFPA 2112, Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire, 2001 Edition	***Adopted***	
100	NFPA 2113, Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire	R	Yes
101	NIJ Guide 100-98, Selection and Application Guide to Police Body Armor	R	Yes
102	NIJ Standard 0101.04, Ballistic Resistance of Personal Body Armor	***Adopted***	
103	NIJ Standard 0104.02, Riot Helmets and Face Shields	R	
104	NIJ Standard 0106.01, Ballistic Helmets	R	
105	NIJ Standard 0108.01, Ballistic Resistance Protective Materials	R	
106	NIST SP 800-36, Guide to Selecting Information Security Products	R	
107	NIST SP 800-41, Guidelines on Firewalls and Firewall Policy	R	
108	NIST SP 800-45, Guidelines on Electronic Mail Security	R	
109	NIST SP 800-48, Wireless Network Security 802.11, Bluetooth and Handheld Devices	R	
110	NVLAP program (NIST) currently provides accreditation for several different types of whole body and extremity dosimeters	R	

[1] *IAB Adopted Standard, or [R]eference Only Standard*

[2] *"Yes" indicates standard for the use or care of personal protective equipment - not a certification standard.*

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