

South Carolina Firefighter Mobilization Hazardous Materials Working Group

1. Field Testing						
FEMA Capability	Field Testing Type 3- Ability to Conduct presumptive testing and identification of chemical substances using a variety of sources to be able to identify associated chemical and physical properties. Type 2- Includes the previous plus unknown products. Type 1- Both of the previous plus known or suspected Weapons of Mass Destruction (Chemical/Biological)					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
1.1 Color Change Analysis						
1.1.1	Test Strips, pH Paper: To test the acidity or alkalinity of aqueous solutions	1 PKT		R	R	NA
1.1.2	Oxidizer Test Strips: Physical or chemical property sensitive	1 PKT		R	R	NA
1.1.3	WMD Chemical Test Strips:(M-8) Military grade detection papers for field testing of liquids. (for nerve agents GA, GB, GD, GF, VX and blister agents	1 PKT		R	NA	NA
1.1.4	WMD Chemical Test Paper Roll: (M-9) Military grade. (For nerve or blister agents)	1 PKT		R	NA	NA
1.1.5	WMD Chemical Test Card: (M256A1) Military grade (for nerve, blister, and blood)	1 PKT		R	NA	NA
1.2 Qualitative Analysis						
1.2.1	Unknown Industrial Chemical Test: For testing and detection of unknown industrial chemicals. (ex. HazCat or 5 Step kit)	1 Complete Kit of any one of these listed		R	NA	NA
1.2.2	Gas Chromatography: Portable chromatograph system					
1.2.3	Infra-red Spectroscopy: Portable identification system used to identify products by comparing fingerprint with internal database.					
1.2.4	Raman Spectroscopy: Portable identification system					
1.3 Colormetric Analysis						
1.3.1	Basic Colormetric Kit - For Industrial chemicals spot analysis of vapors and gases					

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1.3.2	Chip Colormetric Kit: For industrial chemical spot analysis of gases and vapors. (Miniaturized colormetric tubes in a glass or plastic chip)					
1.3.3	Multi-Sensing Colormetric Kit: Used with adapter specifically designed to read up to five or more tubes simultaneously.	1 Complete Kit of any one of these listed		R	R	NA
1.3.4	WMD Special Colormetric Kit: For WMD chemicals spot analysis of vapors and gases	1 Kit		R	NA	NA
1.4 WMD Biological Detection - To be determined later						

3. Sampling Capturing - Labeling - Evidence Collection						
FEMA Capability	Type 3- The ability to capture samples of known industrial chemicals, container, label, and prepare them for transportation for laboratory analysis. This must be consistent with established chain of custody protocols. Type 2- Includes the previous in addition to unknown industrial chemicals. Type 1- Includes both the previous plus the additional resources to capture air samples.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
3.1 Product Capture and Bulk Transfer						
3.1.1	Basic Sampling Kit: Has the ability to obtain and store liquid and solid samples. Kit shall contain assorted clean glass jars, transfer pipettes, swipe sample swabs, long handle dipper, forceps, funnels, spatula, spoon, poly sample jars, sterile glass sample jars, evidence bags, labels, seals, permanent marking pens.	1 Kit		NA	R	R
3.1.2	Advanced Sampling Kit: Has the ability to obtain and store liquid, solid, and vapor samples.	1 Kit		R	NA	NA
3.2 Bulk Liquid Transfer						
3.2.1	Drum Syphon Pump: For 55 Gallon Drums. Suitable for flammable liquids	1		R	R	R
3.2.2	Diaphragm Hand Pump: Portable hand pump.	1		R	R	R

2. Air Monitoring						
FEMA Capability	Type 3- The ability to detect the presence of known gases and vapors. (O2, Flammability, CO, H2S) Type 2- The ability to detect the presence of known or unknown gases and vapors. Type 1 The ability to perform the previous in addition to Chem/Bio monitoring.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
2.1 Atmospheric Monitoring						
2.1.1	OSHA Standard Four Gas Confined Space: Continuous monitoring, built-in alarms, minimum of 10 ft sample tubing. (O2, LEL, CO, & H2S)	See Quantity on the right		3 ea	2 ea	1 ea
2.1.2	Toxic Vapor / VOC: Photo-ionization Detector	See Quantity on the right	Can be combined with 2.1.1	2 ea	1 ea	NA
2.1.3	Calibration Kit: One for each type of the above that ma be in inventory	1 Kit for each type		R	R	R
2.2 Specialty Gas Capability						
Each team must have the capability to detect, identify, and quantify each of the following gases. Any one of several technologies may be used to accomplish this, such as color metric tubes, electrochemical sensors, or PID's.						
2.2.1	Ammonia: Detect ammonia vapors to ppm	1 unit		R	O	NA
2.2.2	Freons: (Halogenated Hydrocarbons)	1 unit		R	O	NA
2.2.3	Halogen Gases: Specifically chlorine and Bromine	1 unit		R	O	NA
2.2.4	Phosphine	1 unit		R	O	NA
2.2.5	Calibration Kit: One for each type of the above that ma be in inventory	1 per unit		R	O	NA
2.3 WMD Chemical Dedicated Instruments						
2.3.1	Nerve Agent Detection: This includes GA,GB,GD,GF, & VX. (Ex. APD 2000)	Must have the ability to monitor/detect at least one substance in each of the six categories. This may require one to several instruments		R	NA	NA
2.3.2	Blister Agent/Mustard Detection: This includes H, HD, and HN. (Ex. APD 2000)			R	NA	NA
2.3.3	Blister Agent/Lewisite Detection: This includes L & HL (Ex. APD 2000)			R	NA	NA
2.3.4	Choking/Vomiting Agents: This includes CG, DP, & CL. (Ex. APD 2000)			R	NA	NA
2.3.5	Blood Agent Detection: AC, HCN, CK, & SA. (Ex. APD 2000)			R	NA	NA

2.3.6	Incapacitating Agents: Pepper, OC (Ex. APD 2000)	several instruments, depending on the versatility.		R	NA	NA
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4. Radiation Monitoring/Detection

FEMA Capability	Type 1- The ability to accurately interpret readings from the devices and conduct geographical survey of suspected source or contamination spread. Type 2- The previous in addition to survey capabilities for alpha, beta, and gamma. Type 3- The previous in addition to the ability to establish the exclusion zones, the ability to conduct environmental and personnel survey. Must be able to supply survey teams with self-reading dosimeters.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
4.1 Alpha, Beta, and Gamma Identification and Survey						
4.1.1	Gamma Detection Meter: Capable of detecting gamma radiation, with visual display.	1 Unit, Combination will satisfy requirement		R	R	R
4.1.2	Beta Detection Meter: Capable of detecting beta radiation, with visual display			R	R	R
4.1.3	Alpha Detection Meter: Capable of detecting alpha radiation, with visual display. Can contain built-in detector or incorporate separate probes.			R	R	R
4.2 Dosimeter						
4.2.1	Direct Reading Dosimeter: Direct reading of accumulated dose.	See Quantity		20	NA	NA
4.2.3	Re-charger for Dosimeter:	1 Kit		R	NA	Na
4.3 Radionuclide Identification						
4.3.1	Radio-Nuclide Detection: Handheld instrument which in clues internal/external detector.			O	O	O

5. Chemical Protective Clothing						
FEMA Capability	Type 3- Liquid Splash Protective Ensembles. Type 2- Preceding in addition to Vapor Protective CPC and Flash Protective CPC. Type 1- Preceding in addition to WMD Vapor Protective Clothing.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
5.1 Vapor Protective						
5.1.1	Vapor Protective Ensemble: NFPA 1991 Industrial Chemicals	5.1.2 will satisfy requirement for 5.1.1		25	10	NA
5.1.2	Vapor Protective Ensemble: NFPA 1991 WMD Chemical Biological option.			25	10	NA
5.1.3	VAPOR PROTECTIVE, with 1991 Flash Fire Escape: Includes additional NFPA 1991 Flash Fire Escape Protection Option			O	O	O
5.1.4	Pressure Test Kit: Manufacturer approved			1	1	NA
5.2 Liquid Splash Protective						
5.2.1	Liquid Splash Protective: NFPA 1992 Jumpsuit or two piece garment	5.2.2 will satisfy requirement for 5.2.1				
5.2.2	Liquid Splash Protective Garment: NFPA 1994 WMD Chem/Bio Ensemble			25	10	10
5.2.3	Limited Use Splash Protective: (Ex. Tyvek)			100	50	50
5.3 Ancillary Protective Equipment						
5.3.1	Vapor Protective Replacement Glove: Compliant to NFPA 1991			O	O	O
5.3.2	Under-glove: Lightweight disposable type glove used as an "inner" glove for 1991 and 1992 ensembles. Also for light duty work, handling, & sampling.	200		R	R	R
5.3.3	Outer-Glove: Used as outer layer of 1991 and 1992 ensemble. Assorted materials for chemical compatibility (Butyl, Vyton, Neoprene)	Numbers need to reflect local hazard need		25	25	25

5.3.4	Chemical Resistant Boots: For use with 1991 and 1992 garments.	Numbers to reflect local need		25	25	25
5.3.4	Outer Protective Bootie: Disposable chemical protective bootie. Can be used to slip over general work boot for use in low threat environments.			25	25	0
5.3.5	Helmet: Lightweight style helmet to provide head protection in CPC. Needs to include suspension system, chin strap, and slim profile brim.			25	10	10
5.3.6	Eye Protection: Can be goggles or safety style glasses.	Need to be readily available to each team member		1 ea	1 ea	1 ea
5.3.7	Fire Resistant Undergarment: Jumpstyle or two piece garment or fire resistant material. To be used as general work clothing or worn under CPC in Flammable hazard areas. (Nomex, PBI)			15	10	NA

6. Technical Reference						
FEMA Capability	Type 3- Have access to and be able to use various databases, chemical substance data resources and other guide materials. These sources can be in print, electronic, or other data available through telecommunications. Type 2- The preceding with the addition of on source for air-modeling. Type 1- The preceding to include references for WMD Chem/Bio materials.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
6.1 Printed Reference Industrial and WMD Chemicals						
6.1.1	Printed Database: Technical data, physical, chemical, and toxicological properties	1		R	R	R
6.1.2	Printed Guidebook: Intervention, incident handling, hazard assessment	1		R	R	R
6.1.3	Special Resource Guide: Special Topics (Rail tank cross sections, pesticides, explosive precursor)	1		R	R	NA
6.1.4	Printed NFPA Standards: Adopted consensus standards (NFPA 471, 472, 473, 1991 & 1994)	1		R	R	R
6.1.5	Printed Response Guidelines: Local, Municipal, Regional, and State response plans	1		R	R	R
6.1.6	WMD Chemical/ Biological Reference: Technical response information	1		R	NA	NA
6.2 Electronic Reference Industrial and WMD Chemicals						
6.2.1	Electronic Database: Technical Data, physical, chemical, and toxicological properties	Could be 1 to 4 separate programs depending upon versatility		R	R	NA
6.2.2	Electronic Guidebook: Intervention, incident handling, hazard assessment			R	R	NA
6.2.3	Electronic Special Resource Guide: Special Topics (Rail tank cross sections, pesticides, explosive precursor)			R	R	NA
6.2.4	Electronic WMD Chemical/ Biological Reference: Technical response information			R	NA	NA
6.3 Plume Modeling						
6.3.1	Modeling Software Database (Ex. Cameo)	1 Program		R	R	NA
6.3.2	Overlay / Plume Display Software (Ex. Aloha)	1 Program		R	R	NA
6.3.3	Model Mapping (ex. Marplot)	1 Program		R	R	NA
6.4 Computer - Hardware and Software						

6.4.1	Computer: For on scene use. With needed drives and ports.	Can be single all-in-one unit or separate units.		R	R	NA
6.4.2	Printer: For on scene use.			R	R	NA
6.4.3	Fax Capability: For on scene use. To include the ability to send and receive.			R	R	NA
6.4.4	Copy Machine: For on scene use			R	R	NA
6.4.5	Internet Access: Wireless connection for on scene usage.	1 Capability		R	R	NA
6.4.6	Camera: For on scene photo assessment. Can be digital or film	1		R	R	R

7. Special Capabilities						
FEMA Capability	Type3- Additional resources that augment the capabilities of the team. Type 2- The preceding with the addition of light amplification capability. Type 3- The preceding with the addition of digital documentation.					
Inventory	Item Name and Description	Requirement	Notes	Type 1	Type 2	Type 3
7.1 Advanced Vision Technologies						
7.1.1	Basic Light Amplification Scope: Handheld, portable device			O	O	NA
7.1.2	Temperature Sensing Scope: Handheld, direct reading temperature instrument	Can be combined into single unit		R	R	NA
7.1.3	Handheld Thermal Imaging: Handheld thermal imaging camera			R	R	NA
7.1.4	Digital Video Camera System: Portable, handheld color video camera, with laser pointer, microphone, mountable on tripod	1		R	NA	NA
7.2 Advanced Weather Technology						
7.2.1	Weather Station: Portable or fixed mount. Capable of sending data back to receiver or a host computer.	1 Weather System		R	R	NA

8. Intervention						
FEMA Capability	Type 3- The employment of mechanical means of intervention and control such as plugging, patching, off-loading, and tank stabilization. Environmental means such as absorption, dams, dikes, and booms. Type 2- The preceding in addition to chemical means such as neutralization and encapsulation of known and unknown chemicals. Mechanical means include specialty kits for leaks in rail cars and pressurized containers. Type 1- The preceding in addition of the ability to intervene and confine WMD Chem/ Bio Substances.					
Inventory	Item Name and Description	Required	Notes	Type 1	Type 2	Type 3
8.1 Chemical Intervention						
8.1.1	Acid Neutralization: the ability to neutralize up to 5 gallons of concentrated acid	Sufficient Amount		R	R	NA
8.1.2	Alkali Neutralization: the ability to up to 5 gallons of base	Sufficient Amount		R	R	NA
8.2 Environmental Intervention						
8.2.1	Non-Polar Solvent Pads: (Pads or Rolls)	150 sq Feet of Coverage		R	R	R
8.2.2	Polar Solvent Pads:	150 sq Feet of Coverage		R	R	R
8.2.3	Non-Polar Solvent Booms:	40 ft Total		R	R	R
8.2.4	Polar Solvent Booms:	40 ft Total		R	R	R
8.2.5	Plastic Pipe: Assortment of various PVC pipe to aid in construction of over and under flow dams.			R	R	R
8.3 Mechanical Intervention						
8.3.1	Chlorine "A" Kit:	1 Kit		R	R	NA
8.3.2	Chlorine "B" Kit	1 Kit		R	R	NA
8.3.3	Chlorine "C" Kit	1 Kit		R	R	NA
8.3.4	Sulfur Dioxide Gasket Kit for Chlorine "A"	1 Kit		R	R	NA
8.3.5	Sulfur Dioxide Gasket Kit for Chlorine "B"	1 Kit		R	R	NA
8.3.6	Sulfur Dioxide Gasket Kit for Chlorine "C"	1 Kit		R	R	NA
8.3.7	Pipe Patch and Repair Kit	1 Kit		R	R	R
8.3.8	Tanker Patch Kit	1 Kit		R	R	R
8.3.9	Drum Patch Kit	1 Kit		R	R	R
8.3.10	Conical Plug Kit	1 kit		R	R	R
8.3.11	Assorted Dowel Plug Kit	1 Kit		R	R	R

8.3.12	Screw Clamp Dome Clamps	Set of 4		R	R	R
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10. Communications						
FEMA Capability	Type 3- Personnel utilizing CPC shall be able to communicate appropriately and safely with one another and their team leaders. Type 2- The preceding with the addition of wireless data. Type 1- The previous with the addition of secure communications.					
Inventory	Item Name and Description	Required	Notes	Type 1	Type 2	Type 3
10.1 Radio						
10.1.1	Portable Radio: with spare battery and hardware to be worn on person.			15	10	10
10.1.2	In-Suit Communications: Complete with earphone system, microphone system, remote "push-to-talk" and hardware to connect to portable radio			6	6	NA
10.1.3	800 Mhz. Capable Radio: Radio with required mutual talk groups	1		R	R	R
10.2 Cellular Phone						
10.2.1	Cellular Phone	1		R	R	R

9. Decontamination						
FEMA Capability	Type 3- Must be self-sufficient to provide decontamination for members of their team from known contaminants. Type 2- the preceding with the additional capability of providing decontamination of unknown contaminants. Type 3- The preceding with the addition of the ability for providing decontamination of wmd Chem/Bio contaminants.					
Inventory	Item Name and Description	Required	Notes	Type 1	Type 2	Type 3
9.1 Ground Protection						
9.1.1	Roll of Plastic Sheeting	1 Roll		R	R	R
9.1.2	Gross Decontamination Shower: With catch basin available	1		R	R	NA
9.1.3	Eye Wash: Ability to wash eyes at scene	1		R	R	R
9.1.4	Containment Pools: For use in Decon Line	3		R	R	R
9.2 Support Tool for Decontamination						
9.2.1	Portable Stool: Stacking or folding	4		R	R	R
9.2.2	Long Handle, Soft Bristle Brushes:	4		R	R	R
9.2.3	Car Wash Style Brushes	2		R	R	R
9.2.4	Towels: Commercial or Disposable	8		R	R	R
9.2.5	Traffic Cones	12		R	R	R
9.2.6	Detergent Soap	1 Pint		R	R	R
9.2.7	Chemt-Tape:	4 rolls		R	R	R
9.2.8	Clothing Removal Tool: Medic Shears	1		R	R	R
9.3 Water Supply & Distribution Tools						
9.3.1	1.5" or 2.5" to Garden hose Adapter	2		R	R	R
9.3.2	Fire hose to multiple garden hose manifold: 1.5" or 2.5"	1				
9.3.3	Garden Hose					
9.3.4	Garden Hose Inline Shut-off	1				
9.3.5	Hydrant Wrench	1				
9.4 Collection						
9.4.1	5 Gallon Buckets	4		R	R	R
9.4.2	Heavy Duty Garbage Bags	10		R	R	R
9.4.3	Containment Drum: Multi use for Decon containment or overpack for leak	Set		R	R	R
9.4.4	Drum Liner:	10		R	R	R

11. Respiratory Protection						
FEMA Capability	None					
Inventory	Item Name and Description	Required	Notes	Type 1	Type 2	Type 3
11.1 SCBA and Supplied Air						
11.1.1	Structural SCBA			NA	NA	6
11.1.2	CBRN Compliant SCBA: 1 Hr Rating			15	10	NA
11.1.3	Spare Cylinders	1 For Each SCBA		R	R	R
11.1.4	Supplied Air System:	System to Accommodate 4 Users		O	NA	NA
11.2 Air Purifying Respirator						
11.2.1	CBRN APR Mask: Full face, single or dual cartridge style		Can be face piece from SCBA	15	10	NA
11.2.2	APR Cartridge: certified for industrial chemical threats	30		R	R	NA
11.2.3	APR Cartridge: certified for WMD/CBRN threats	30		R	NA	NA