The InterAgency Board Charter

In order to ensure standardization and interoperability throughout the response community, the Attorney General of the United States has sanctioned an interagency board consisting of officials from various local, state, and federal government organizations to develop, maintain, and update a national standardized equipment list (SEL) for use by the interagency community in preparing for and responding to weapons of mass destruction (WMD) terrorism.

The Survivor Tree

The Survivor Tree, an American Elm, bears witness to the violence of April 19 and now stands as a profound symbol of human resilience. The circular promontory surrounding the tree offers a place for gathering and viewing the memorial.

"To the courageous and caring who responded from near and far we offer our eternal gratitude."

Courtesy of the Oklahoma City National Memorial

Dedication

For no greater cause exists today than that embraced by our nation's responders in taking the front line and standing ever vigilant to protect the country from those who would attempt to deny us our freedom.

THE INTERAGENCY BOARD

Over the past year, the InterAgency Board for Equipment Standardization and InterOperability (IAB) has worked hard to better prepare the nation to combat terrorism specifically through its chartered mandate to "develop, maintain, and update a national standardized equipment list (SEL) for use by the interagency community in preparing for and responding to weapons of mass destruction terrorism." This report chronicles the steps by which this has been accomplished. It also discusses strategies for equipment research and development support to local, state, and federal response organizations, and it sets forth lessons learned by IAB members. We are indeed pleased to report our accomplishments to the nation's responders in the InterAgency Board's 2000 Annual Report, highlights of which are:

The 2000 Marshall Convention on Standardized Weapons of Mass Destruction (WMD) Response Force Equipment and InterOperability

The IAB, the Oklahoma City National Memorial Institute for the Prevention of Terrorism, and four Industry Associations conducted the 2000 Marshall Convention from 16 to 20 October 2000 in Oklahoma City. Approximately 90 federal, state, and local government officials and members of industry representing more than 50 organizations met for discussions, briefings, and work sessions. They were also briefed by the Incident Commander for the Alfred P. Murrah Federal Building bombing and given a tour of the Oklahoma City National Memorial.

Publishing the 2001 Standardized Equipment List

The 2001 SEL is more detailed than previous lists and provides more specificity to the equipment description. It also contains a series of matrices for Best Practices for Medical Management of WMD Events; Science and Technology Requirements for 2001; and a Strategic Plan for Developing Chemical, Biological, Radiological, Nuclear, and Explosives Equipment Standards.

Publishing the InterAgency Board By-Laws

On the 18th of October 2000, the InterAgency Board's Co-Chairs and SubGroup Chairs formalized the workings of the InterAgency Board by establishing and publishing the By-Laws, 12 Articles that define the internal procedures of the InterAgency Board. The InterAgency Board now, accordingly, consists of six SubGroups, chaired by a local or state official, supported by a federal co-chair, and made up of a panel of subject matter experts. The two IAB Co-Chairs organize and facilitate the actions of the Board. An Executive Committee of federal partners provides direct support from the member federal agency to the Board. The InterAgency Board completes its membership with distinguished associates who act as technical advisors from both government and industry.

Preface

Forging Strategic Partnerships with New Members

Several key organizations have recently joined the Board's ranks, including the National Sheriff's Association, the International Association of Fire Fighters, the International Association of Chiefs of Police, the National Emergency Management Association, and the Oklahoma City National Memorial Institute for the Prevention of Terrorism.

On behalf of the IAB, we urge you to read through the 2000 Annual Report, the 2001 Standardized Equipment List, and the succession of useful articles, initiatives, strategic plans, and achievements over the past year. We invite continued involvement by the response community. We believe that the Board's success is the nation's success, and our goal is to better prepare ourselves and this country to defend against acts of terrorism in the United States, for "Out of Many, One."

THE INTERAGENCY BOARD CO-CHAIRS

Centers for Disease Control and Prevention
City of Boise Fire Department
City of Boston Police Department
City of Chicago Fire Department, Hazardous Materials Unit
City of Dallas Fire Department
City of Lexington, Massachusetts Fire Department
City of New York Fire Department
City of Orlando Fire Department
City of Phoenix Fire Department
City of Seattle Fire Department
County of Los Angeles Fire Department
Downers Grove, Illinois Fire Department
Emergency Management Services, Arlington County, Virginia
Federal Emergency Management Agency
Hennepin County Sheriff's Office
International Association of Chiefs of Police
International Association of Fire Chiefs
International Association of Fire Fighters
Lawrence, Kansas Police Department
Los Angeles County Sheriff's Department
Los Angeles Fire Department
Louisiana State Police
Massachusetts Emergency Management Agency
Missouri Department of Health
National Association of Emergency Medical Technicians
National Bomb Squad Commanders' Advisory Board
National Fire Protection Association
National Institute for Occupational Safety and Health
National Institute of Standards and Technology
National Sheriff's Association
Oklahoma City National Memorial Institute for The Prevention of Terrorism
Orange County, California Fire Authority
Pinellas County, Florida Emergency Medical Services
Sarasota County Fire Department
Technical Support Working Group
United States Army Soldier and Biological Chemical Command
United States Coast Guard, National Strike Team
United States Department of Defense
United States Department of Defense, Defense Threat Reduction Agency
United States Department of Defense, Department of The Army
United States Department of Defense, Department of The Army, Center for Health Promotion and Preventive Medicine
United States Department of Defense, Director of Military Support
United States Department of Defense, Joint Program Office for Biological Defense
United States Department of Energy
United States Department of Health and Human Services, Office of Public Health and Science
United States Department of Justice, Federal Bureau of Investigation
United States Department of Justice, Office of Justice Programs, National Institute of Justice
United States Department of Justice, Office of Justice Programs, Office for State and Local Domestic Preparedness Support
United States Department of Labor, Occupational Safety and Health Administration
United States Department of Veterans Affairs
United States Environmental Protection Agency
United States Marine Corps
United States Marine Corps Chemical Biological Incident Response Force
University of Missouri Fire and Rescue Training Institute
Virginia Department of Emergency Management
Yale University School of Medicine

The InterAgency Board for Equipment Standardization and InterOperability

2000 Annual Report

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The InterAgency Board

Team 5

A Rescue Worker originally painted the message on this wall during search and recovery efforts in April 1995. The building on which it is painted was a functioning office building when the bomb exploded across the street. Ceilings collapsed, walls fell in and glass shards flew throughout the building. Hundreds of people were injured, many critically. Fortunately, no one was killed inside this building.

COURTESY OF THE OKLAHOMA CITY NATIONAL MEMORIAL

Introduction

The Origins

Responding to growing concerns about the nation's ability to defend against weapons of mass destruction terrorism, the Attorney General of the United States sanctioned the creation of an interagency board to ensure equipment standardization and interoperability, to encourage research and development of advanced response technologies, and to assist First Responders at the state and local levels in establishing and maintaining a robust crisis and consequence management capability.

The Department of Defense's Consequence Management Program Integration Office and Department of Justice's Federal Bureau of Investigation Weapons of Mass Destruction Countermeasures Unit founded the InterAgency Board with its first meeting on 13 October 1998, with the thankful participation of various local, state, and federal government organizations, and immediately embarked upon a collective effort to standardize weapons of mass destruction response equipment.

The Charter

In order to ensure standardization and interoperability throughout the response community, the Attorney General of the United States has sanctioned an interagency board consisting of officials from various local, state, and federal government organizations to develop, maintain, and update a national standardized equipment list (SEL) for use by the interagency community in preparing for and responding to weapons of mass destruction (WMD) terrorism.

Strategic Objectives

The InterAgency Board has four strategic objectives. The first is to achieve unity of effort throughout the WMD response community through the InterAgency Board's researched and developed national standardized equipment list. The second is to achieve economies of scale by leveraging acquisition vehicles to purchase WMD response equipment. The third, as directed by Congress, is to transfer military knowledge, expertise, and technology regarding the detection, warning, protection, and decontamination of WMD to appropriate local, state, and federal personnel. The fourth is to promote interoperability among designated civil and military WMD response units at local, state, and federal levels.

Organization of the Board

The InterAgency Board's six commodity area SubGroups are Medical, Personal Protective and Operational Equipment, Science and Technology, InterOperable Communications and Information Systems, Detection and Decontamination, and Standards Coordination.

Each SubGroup is chaired by a First Responder, supported by a Federal Co-Chair, and consists of panels of subject matter experts selected by the SubGroup Chairs who specialize in their area of interest. Each SubGroup researches equipment, technologies, and professional services to develop

its section of the SEL. Assisting the SubGroups and the InterAgency Board as a whole are two IAB Co-Chairs who administer, organize, and facilitate the actions of the Board and support the SubGroup Chairs in accomplishing their goals and objectives. The InterAgency Board also invites selected federal government agencies to support the InterAgency Board's charter. Their representatives are designated Associates, who provide direct interface and support between the Board and each federal agency.

The InterAgency Board Process

The IAB operates on a quarterly cycle that commences with the production of the SEL in the First Quarter. In the Second Quarter, the SubGroups update their subsection of the SEL and develop requirements. In the Third Quarter, the Board prepares for the Advanced Concepts and Technology Exchange (ACTE). In the Fourth Quarter, the Board conducts the ACTE to research and develop the next year's SEL.

During the Fall IAB Meeting, the IAB identifies new equipment requirements and updates the SEL. A Request for Information (RFI) covering equipment, advanced technology, and professional services to support combating domestic weapons of mass destruction terrorism is published announcing the ACTE. During the ACTE, those organizations interested in supporting the government with the development of the SEL are encouraged to participate by providing written submittals of the product or service.

Guiding Principles

The InterAgency Board belongs to the local and state officials who participate on the Board. All members of the Board are subject matter experts in their specific field. All members of the Board represent their organizations. The InterAgency Board represents an interactive process, facilitated from start to finish. Its work is important...what it does today…shapes tomorrow, for success in defending against the emerging threat of WMD terrorism depends on the coalition of strengths, talents, and resources at all levels and in all sectors, in a dedicated and unified effort. For out of many, we come as one to combat terrorism.

"Out of Many, One"

The InterAgency Board Structure

The IAB is organized into six SubGroups that are chaired by a First Responder, supported by a Federal Co-Chair, and staffed with subject matter experts in that SubGroup's area of interest. Each SubGroup is responsible for maintaining its subsection of the SEL.

Medical SubGroup

Addressing casualty treatment for victims of a conventional or non-conventional WMD attack and also preventive measures to avert victimization.

Chair
Porter T. Shellhammer, Battalion Chief, Sarasota County Fire Department

Federal Co-Chair
CPT Michael B. Anderson, U.S. Department of Health and Human Services, Office of Emergency Preparedness

Personal Protective and Operational Equipment SubGroup

Addressing individual equipment, support systems, and area protection for WMD response.

Co-Chairs
Ronald D. Watson, Battalion Chief, County of Los Angeles Fire Department

Jeff Marcus, Battalion Chief, Los Angeles Fire Department

Federal Co-Chair
William E. Haskell III, U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

Science and Technology SubGroup

Focusing on advanced concepts entering development and newly emerging technologies that might be applied to crisis and consequence management.

Chair
Vincent J. Doherty, Captain, Hazmat Operations, City of New York Fire Department

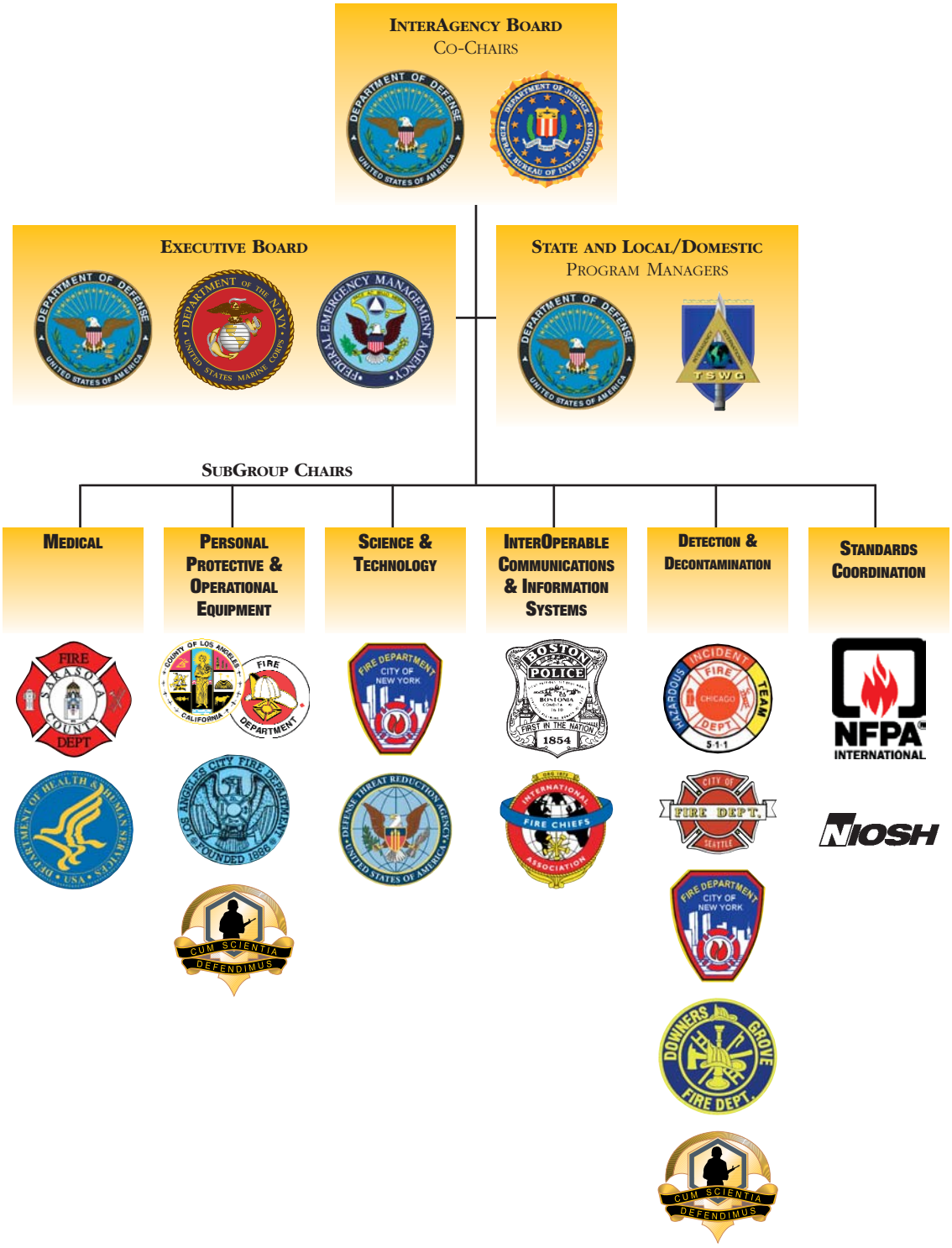
Federal Co-Chair
Hossam E. Ahmed, U.S. Department of Defense, Defense Threat Reduction Agency

InterOperable Communications and Information Systems SubGroup

Addressing communications, information management, technical information support, and public awareness issues.

Chair
Eric E. Hahn, Commanding, Environmental Safety Group, Special Operations Division, City of Boston Police Department

Association Co-Chair
Andrew H. White, International Association of Fire Chiefs


InterAgency Board
Co-Chairs
Executive Board
State and Local/Domestic
Program Managers
TSWG
SubGroup Chairs
Medical
Personal Protective & Operational Equipment
Science & Technology
InterOperable Communications & Information Systems
Detection & Decontamination
Standards Coordination
FIRE SARASOTA COUNTY DEPT
DEPARTMENT OF HEALTH & HUMAN SERVICES USA
COUNTY OF LOS ANGELES FIRE DEPARTMENT CALIFORNIA
LOS ANGELES CITY FIRE DEPARTMENT FOUNDED 1886
CUM SCIENTIA DEFENDIMUS
FIRE DEPARTMENT CITY OF NEW YORK
DEFENSE THREAT REDUCTION AGENCY UNITED STATES OF AMERICA
BOSTON POLICE FIRST IN THE NATION 1854
INTERNATIONAL FIRE CHIEFS ASSOCIATION
HAZARDOUS INCIDENT TEAM CHICAGO FIRE DEPT 5-1-1
CITY OF SEATTLE FIRE DEPT.
FIRE DEPARTMENT CITY OF NEW YORK
DOWNERS GROVE FIRE DEPT.
CUM SCIENTIA DEFENDIMUS
NFPA INTERNATIONAL
NIOSH

Detection and Decontamination SubGroup

Focusing on intrusive and non-intrusive detection; monitoring, sampling and analysis of suspected toxins; and methods to mitigate or dissipate a contamination.

Chair
Gene Ryan, Chief Hazardous Materials, City of Chicago Fire Department

Co-Chairs
Steven A. Beaumont, Lieutenant, City of Seattle Fire Department
Robert J. Ingram, Battalion Chief, Special Operations, City of New York Fire Department
Wes Thomas, Battalion Chief, Downers Grove, Illinois Fire Department

Federal Co-Chair
William E. Haskell III, U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

Standards Coordination SubGroup

Ensuring that WMD response equipment and technology is integrated in the existing standards boards and regulatory bodies.

Chair
Stephen N. Foley, National Fire Protection Association

Federal Co-Chair
John M. Dower, National Institute for Occupational Safety and Health

IAB Co-Chairs

MAJ Adrian T. Bogart III, U.S. Department of Defense

Supervisory Special Agent John N. Frank, Federal Bureau of Investigation

IAB Executive Board

COL Jay S. Steinmetz, Director, Consequence Management Program Integration Office, U.S. Department of Defense

Charles R. Bell, PM Marine/NBC, Marine Corps Systems Command

Thomas M. Antush, Senior Policy Officer, Federal Emergency Management Agency

The InterAgency Board SubGroup Reports:

Achievements in 2000

Gates of Time

Monumental twin gates frame the moment of destruction – 9:02 and mark the formal entrances to the memorial. The east gate represents 9:01 on April 19th. The west gate represents 9:03.

Courtesy of the Oklahoma City National Memorial

SubGroup Reports: Achievements in 2000

Medical SubGroup

Mission

The InterAgency Board Medical Subgroup shall provide guidance on methodologies, equipment, and standards on casualty treatment for victims of a conventional or non-conventional WMD attack and also on preventive measures to avert victimization.

Function and Roles

The Medical SubGroup focuses on "casualty treatment for victims of a conventional or non-conventional WMD attack and also on preventive measures to avert victimization." Recognizing that the InterAgency Board's SEL is the national standard for WMD response equipment, it ensures that the medical section of the SEL is an intricate part of the overall national effort—a baseline to guide the initial medical responders and the broader medical community in being properly equipped to manage the consequences of a WMD terrorist attack. It continually updates this part of the SEL to support the roles and missions of the medical response community and thereby to ensure that, within the United States, there exists a robust and up-to-date crisis and consequence management infrastructure to support the national mission to combat terrorism.

To guide its work, the Medical SubGroup uses a timeline discussion that identifies the medical needs during the various stages of a WMD terrorism attack and response. This discussion is designed to pinpoint:

- Who will be doing what at what time in the event;
- What medical equipment, services, and products are needed for those actions—both for the benefit and safety of the responder/provider and for community protection;
- What are the roles, realistic expectations, and limitations of all of the WMD medical response participants; and,
- How can existing capabilities be improved?

Initiatives and Progress in 2000

The Medical SubGroup (MSG) met once as a group during 2000, and it also participated in the second Marshall Convention. In the course of the year, it 1) formulated and accepted assumptions on which SEL recommendations would be based; 2) developed a matrix of medical equipment and supply needs during a WMD event for use by local affected communities; and 3) compiled recommendations for its section of the SEL.

SEL Assumptions:

- The list items should not be limited to supporting WMD/chemical/biological (CB) events—they should encompass a multi-hazard solution approach.
- The First Responder and the community's medical infrastructure will be an initial critical element in the local government's response to an event.

Chair

Porter T. Shellhammer
Battalion Chief, Sarasota County Fire Department

Federal Co-Chair

CPT Michael B. Anderson
U.S. Department of Health and Human Services, Office of Emergency Preparedness

Membership

Sandy Bogucki, M.D.
Yale University

Paul D. Kim, M.D.
Area Emergency Manager, Emergency Management Strategic Healthcare Group, U.S. Department of Veterans Affairs

Paul M. Maniscalco, Ph.D., MPA, EMT/P
Past President, National Association of Emergency Medical Technicians (NAEMT); Deputy Chief/Paramedic, City of New York Fire Department Emergency Medical Command

Ken Miller, M.D., Ph.D.
Medical Director, Orange County Fire Authority; Assistant Medical Director, Orange County EMS Agency

R. Bruce Pettyjohn, M.D.
Medical Director, Pinellas County, Florida

Stephen Skowronski
Centers for Disease Control and Prevention, National Pharmaceutical Stockpile Program

Tom Skowronski
City of Phoenix Fire Department

David M. Spicer
Emergency Management/Terrorism Response Coordinator, Missouri Department of Health

Thomas R. Walsh
Medical Services Officer, City of Seattle Fire Department

- All components of the medical community will be impacted.
- An event will create a logistics-scarce environment resulting in the need for a push-logistics system for supporting continuing care.
- The list should be limited to essential items anticipated to become scarce once an incident occurs.
- Local jurisdictions must address the following: Adequate (numbers of) personnel, appropriate training, personal protective equipment (PPE), agent identification capabilities, and decontamination capabilities to admit non-contaminated patients to the treatment facility.

MATRIX DEVELOPMENT:
The Medical SubGroup developed a matrix of Best Practices for Medical Management of WMD Events (Appendix A) to capture the medical equipment and supply needs anticipated during patient treatment resulting from a WMD event. This tool, when used in conjunction with a local hazard/risk analysis study, is designed to help local medical communities prepare for multiple patient incidents that overwhelm the locality's capacity.

The horizontal headings represent segments of the chronological progression of an incident. The first column of the matrix, beginning with Training, identifies the type of incident: Incendiary/Explosive, Radiological, Organophosphate Chemicals, Blood Agent Chemicals, Blister Chemicals, Biological—Toxins, and Biological—Infectious. The resulting intersections in the matrix then present recommendations for needed equipment and supplies according to four basic categories: Respiratory, Pharmaceutical, Emergency Medical Service (EMS) PPE, and Trauma. These are not listed in any priority ranking. Commentary is also provided in the matrix relating to the medical infrastructure.

SEL RECOMMENDATIONS:
In compiling the recommended equipment list, the Medical SubGroup solicited, collected, and evaluated existing medical equipment lists currently used by other agencies. The medical equipment and supply list, attached to the SEL, distills the recommended items identified for the National Medical Response Teams under the auspices of the U.S. Public Health Service (PHS).

CONCLUSIONS

- There is no "cookie cutter" list for a medical community to prepare for an overwhelming event. To help quantify the problems facing a community, communities should use the following broad process steps to begin a study of community preparedness:
  - Frame the threat
  - Evaluate levels of preparedness
  - Examine existing capacity
  - Identify solutions and make recommendations
- The maximum number of injured persons that can be absorbed by the medical community will vary according to local resources.

A community should plan to be self-sufficient for a minimum of 24-hours following the onset of an incident—requiring communication among all elements of the health care community, e.g. Fire-Rescue, EMS, emergency departments, hospitals, PHS, etc.

- Because a biologic event may not immediately be recognized on the scene, communities should support, encourage, and expand the Centers for Disease Control and Prevention (CDC)'s Sentinel Hospital System as a part of a uniform recognition system that identifies biological agents through monitoring hospital treatments and/or admissions.

The MSG continues to support efforts directed at hastening agent detection and identification capabilities in the field, and providing these tools to the first-line, local responders. It is pleased to note that improved analytical equipment shows promise for characterizing an incident; making positive product identifications to facilitate PPE selection; and designing definitive courses for patient treatment when time is of the essence.

Personal Protective and Operational Equipment SubGroup

MISSION

The Personal Protective & Operational Equipment (PP&OE) SubGroup has the challenging mission of addressing issues of personal protective, operational and collective protection equipment standardization and interoperability. Personal protective equipment encompasses protective ensembles (garments, boots, gloves and hoods) as well as respiratory protective equipment such as self-contained breathing apparatus (SBCA), powered air purifying respirators (PAPR), and negative pressure masks. The PP&OE SubGroup efforts must be closely coordinated with those of the other IAB SubGroups, especially the IAB Standards Coordination SubGroup.

MEMBERSHIP

The PP&OE SubGroup has strong leadership and representation, which includes city and county professional fire service, hazmat operations, and law enforcement agencies. Federal and military organization representatives include the National Institute for Occupational Safety and Health (NIOSH), U.S. Army Soldier and Biological Chemical Command (SBCCOM) and National Institute of Standards and Technology – Office of Law Enforcement Standards (NIST/OLES). During FY00 the PP&OE SubGroup added new members from the U.S. Coast Guard Atlantic Strike Team and the law enforcement bomb disposal/explosive ordnance community. The PP&OE SubGroup will consider new memberships to further expand its representation and expertise.

FUNCTION AND ROLES

The PP&OE SubGroup works diligently to accomplish the following; 1) assist in identification of existing equipment regulatory guidelines and performance standards; 2) support and assist in identification of minimum performance criteria for emergency response operations in toxic industrial chemical, chemical warfare agents, and biological agent environments; and 3) revise and update its sections of the SEL, substantiating those revisions to the core InterAgency Board for final acceptance.

The PP&OE SubGroup further reports equipment categories that do not have acceptable regulatory standards and minimum performance requirements to the IAB Standards Coordination SubGroup for further consideration. In cases where currently available equipment does not meet desired performance criteria, or if new challenges or deficiencies become evident, it reports these to the IAB Science and Technology SubGroup.

To ensure these objectives are met, selected members of the PP&OE SubGroup are also members of the core IAB, Standards Coordination SubGroup and Science and Technology SubGroup. The PP&OE SubGroup members also actively support organizations, associations, and agencies that develop equipment performance criteria and testing standards. The Federal Co-Chair of this SubGroup is a full voting

member on the National Fire Protection Association's (NFPA) Fire and Emergency Services Protective Clothing and Equipment Technical Correlation Committee and the Hazardous Materials Protective Clothing and Equipment Technical Committee. The NFPA Staff Liaison to these committees is also a member of the PP&OE SubGroup.

INITIATIVES AND PROGRESS IN 2000

The PP&OE SubGroup is pleased to report that many federal, military, and industry partners are devoting time and resources to the research and development of protective clothing and equipment to meet professional emergency response, public safety, and military requirements. Progress has also been made in the past year in developing equipment performance and certification standards. PP&OE SubGroup members are involved in these efforts, many in lead and prominent roles. The following are examples of the initiatives and progress made in 2000 directly related to the PP&OE SubGroup:

- The PP&OE SubGroup supported the NFPA Hazardous Materials Protective Clothing and Equipment Technical Committee's completed development on the proposed *NFPA 1994 Standard on Protective Ensembles for Chemical or Biological Terrorism Incidents, 2001 Edition*. This standard shall specify the minimum requirements for design, performance, testing, documentation, and certification of protective ensembles designed to protect fire and emergency service personnel from chemical and biological terrorism agents (including toxic industrial chemicals). Protective ensembles certified to this standard are intended for use by emergency response professionals exposed to victims and threat agents during assessment, extrication, rescue, triage, and treatment operations at or involving chemical or biological terrorism incidents. The proposed NFPA 1994 standard will be presented at an upcoming NFPA national conference for final review and adoption.
- In March 2000, the PP&OE SubGroup and the Detection & Decontamination SubGroup met in Las Vegas, Nevada, at the Las Vegas Fire

CO-CHAIRS

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Battalion Chief, County of Los Angeles Fire Department

Jeff Marcus
Battalion Chief, Los Angeles Fire Department

FEDERAL CO-CHAIR

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U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

MEMBERSHIP

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Lieutenant, City of Orlando Fire Department

John Celentano, M.D.
County of Los Angeles Department of Health Services

William Chandler
Captain, Hennepin County Sheriff's Office

Wayne Davis
U.S. Army Soldier and Biological Chemical Command, PM-NBC Defense

John M. Dower
National Institute for Occupational Safety and Health

Alim A. Fatah
National Institute of Standards and Technology, Office of Law Enforcement Standards

Kathleen M. Higgins
Director, National Institute of Standards and Technology, Office of Law Enforcement Standards

Darrell D. Higuchi
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Glenn Jirka
Hazmat and Counter Terrorism Program Manager, University of Missouri Fire and Rescue Training Institute

Michael Kniest
Industrial Emergency Council

Gail P. Kulisch
Commanding Officer, United States Coast Guard, Atlantic Strike Team

Patrick D. McGowan
Sheriff, Hennepin County, Minnesota

J. Scott Mottram
Assistant Chief, Los Angeles Fire Department

Tony Mussorfiti
Firefighter, Hazmat Instructor, City of New York Fire Department

W. Ronald Olin
Chief of Police, Lawrence, Kansas

Rick Reddy
Captain, City of Boise Fire Department

John Stedman
National Institute of Justice

Charles Stumph
Explosive Ordnance Disposal (EOD) Specialist, Orange County Sheriff's Department

John P. Sullivan
Sergeant, Los Angeles Sheriff's Department, Emergency Operations Bureau

Bruce Teele
National Fire Protection Association

Andrew H. White
International Association of Fire Chiefs

Douglas E. Wolfe
Captain, Sarasota County Fire Department

Department Training Facility, hosted by Fire Chief Mario Trevino. Members of these SubGroups developed a position paper with recommendations to improve the focus and effort of the IAB, then presented these and discussed them with the core IAB membership during a quarterly IAB meeting. It is the consensus of both SubGroups that acceptance of these recommendations is very important in defining the collective IAB effort and will assure its success in the coming years.

- The PP&OE SubGroup supported the Individual Protection – Front End Analysis initiative conducted by the Joint Service Individual Protection Commodity Area Manager with contractual support from Battelle. The PP&OE SubGroup Federal Co-Chair and Technical Support Working Group (TSWG) IAB representative participated in its meetings, and International Association of Fire Fighters (IAFF) representatives participated in the final identification of technology and equipment priorities relevant to the civilian response community. The recommendations were presented by the Federal Co-Chair at the IAB's Marshall Convention in Oklahoma City.
- The PP&OE SubGroup tracked the progress made by the U.S. Army SBCCOM Domestic Preparedness Team on the testing and evaluation of commercial equipment vital to the emergency response community. At the Seattle IAB quarterly meeting, the IAB members agreed to adopt this federally funded effort as the primary source of equipment performance data. The PP&OE SubGroup will continue to track the progress made by SBCCOM on testing and evaluating protective garments, boots, gloves and respiratory protection equipment. The PP&OE SubGroup hopes that additional federal resources can be made available to SBCCOM to continue and expand this important program.
- The PP&OE SubGroup—strongly supporting the development of standards and a certification process for respiratory protective equipment for use against chemical warfare, toxic industrial materials, and biological threats—notes that the Department of Justice and National Institute of Justice provided initial funding during the year for the efforts of the NIOSH-SBCCOM Respiratory Standards Team. The leaders of this team, who are also members of the PP&OE SubGroup, indicate the program will include vulnerability assessment, test method development and validation, laboratory qualification, and acceptance of a certification and approval process. A NIOSH certification process for respiratory protective equipment against chemical warfare and biological agent threats is a priority with the fire service, law enforcement, and emergency response community. The PP&OE SubGroup will continue to support and monitor the progress of the NIOSH-SBCCOM Respiratory Standards Team in 2001.
- The PP&OE SubGroup notes that the joint military services have initiated a new program this past year called the Advanced Bomb Suit (ABS) under the management of the SBCCOM PM-Soldier

Systems with technical expertise provided by Natick Soldier Center. At issue is protective clothing and equipment that provides explosive ordnance and bomb disposal professionals with protection from fragmentation, blast pressure, heat, light flash, and flame threats. Protection against liquid and vapor threats (skin and inhalation) for these professionals has increased in importance as terrorism threats increase. TSWG had funded development of such protective ensembles. The PP&OE SubGroup will look to the ABS program to identify, develop, and integrate industry and military technologies and systems into bomb disposal protective ensembles.

- The NFPA Technical Committees and PP&OE SubGroup members have discussed the need for selectively permeable protective clothing throughout the past year. Professional fire service and emergency response personnel use non-permeable protective clothing for hazardous materials release incidents. These types of protective ensembles provide excellent protection but operation time is limited because of issues like heat stress on the wearer. Permeable and selectively permeable protective technologies that offer longer wear time and reduced heat stress are a priority with response functions such as tactical law enforcement operations and urban search and rescue (US&R). During 2000, the U.S. Army Natick Soldier Center initiated a Dual-Use Science and Technology program to design and fabricate the next generation selectively permeable protective garment systems for military, civilian, industrial, and agriculture applications. Representatives from the Federal Emergency Management Agency (FEMA) Urban Search and Rescue Teams have already provided input on desired design characteristics for the US&R mission. Boston Emergency Medical Service and the PP&OE SubGroup will also be asked to support and participate in this exciting program in early 2001.

CHAIR

Vincent J. Doherty
Captain, Hazmat Operations, City of New York Fire Department

FEDERAL CO-CHAIR

Hossam E. Ahmed
U.S. Department of Defense, Defense Threat Reduction Agency

MEMBERSHIP

CPT Michael B. Anderson
U.S. Department of Health and Human Services, Office of Emergency Preparedness

Steven A. Beaumont
Lieutenant, City of Seattle Fire Department

Edward J. Beban
Firefighter, Hazmat Operations, City of New York Fire Department

Joseph Booth
Louisiana State Police

Todd Brethauer
Technical Support Working Group, WinTec SETA Support

Brett A. Burdick
Virginia Department of Emergency Management

Tracy Cronin
Technical Support Working Group

John M. Dower
National Institute for Occupational Safety and Health

Thomas Emsley
Joint Program Office for Biological Defense, Camber SETA Support

John J. Fanning
Battalion Chief, City of New York Fire Department

Stephen N. Foley
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Eric E. Hahn
Commanding, Environmental Safety Group, Special Operations Division, City of Boston Police Department

William E. Haskell III
U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

Jeff Marcus
Battalion Chief, Los Angeles Fire Department

Gene Ryan
Chief Hazardous Materials, City of Chicago Fire Department

Stanley Rybak
Lieutenant, Hazmat Operations, City of New York Fire Department

Porter T. Shellhammer
Battalion Chief, Sarasota County Fire Department

John Stedman
National Institute of Justice

John P. Sullivan
Sergeant, Los Angeles Sheriff's Department, Emergency Operations Bureau

Chuck Swan
Joint Program Office for Biological Defense

Wes Thomas
Battalion Chief, Downers Grove, Illinois Fire Department

Ronald D. Watson
Battalion Chief, County of Los Angeles Fire Department

Science and Technology SubGroup

MISSION

To identify interagency (federal, state, and local) First Responder R&D requirements and innovative technologies (fieldable in the next 6 months to 5 years) that address chemical, biological, radiological, nuclear, and explosives detection, individual protection, collective protection, medical support, decontamination, communications systems, information technology, and miscellaneous operational support.

FUNCTION AND ROLES

The primary functions of the Science and Technology (S&T) SubGroup are to develop and update the IAB S&T Requirements Matrix for inclusion in the SEL, and to assess innovative government and industry-developed technologies. The IAB S&T Requirements Matrix identifies future technology needs for detection, individual protection, collective protection, medical support, decontamination, communications systems, information technology, and operational equipment (Appendix B).

INITIATIVES AND PROGRESS IN 2000

During the year, the S&T SubGroup accomplished the following:

- Increased SubGroup membership and re-energized its mission.
- Designated mission area team leaders responsible for detailed review and prioritization of S&T needs and projects.
- Reviewed industry submissions for the 2000 Marshall Convention.
- Reviewed the draft 2001 SEL to ensure future needs were included in the S&T Requirements Matrix.
- Investigated means for disseminating the S&T Requirements Matrix to private industry.
- Completed monthly reviews of the S&T Requirements Matrix through December 2000.
- Reconciled the S&T Requirements Matrix with previous federal Interagency R&D requirements efforts.
- Prepared the S&T Requirements Matrix as an appendix to the 2001 SEL.

InterOperable Communications and Information Systems SubGroup

MISSION

The InterAgency Board's InterOperable Communications and Information Systems (ICIS) SubGroup shall identify available equipment/systems and shortfalls thereof, for the coordination and exchange of information (both verbal and data) before, during, and after a potential WMD-type event. Communications, in its many forms, is the element that ties all of the different response assets and disciplines together.

INITIATIVES AND PROGRESS IN 2000

The past year has seen great strides in technology across the entire spectrum of equipment and systems that encompass ICIS areas of interest. These include exciting new concepts in bridging equipment that allow various systems to communicate with each other in both the tactical and strategic levels, and also software refinements that have simplified and modularized formerly complicated applications for Plume Modeling and Incident Management. We are also watching with great interest the emergence of Consequence Management Interoperability Services.

The ICIS SubGroup is currently focusing its efforts on emerging incident management systems, on bridging equipment, and on communications plans.

Consequence Management Interoperability Services (CMIS) is a system that has emerged as a very promising method of allowing an Incident Commander (IC) to exchange tactical information with first and follow-on responders; to manage his assets; and to plan for future duty cycles. It will also allow people at higher, strategic levels to monitor any incident in real time so they can anticipate the needs of the IC. The system will also allow Emergency Managers to better prepare for incidents through training modules, information and intelligence services, and planning templates. Because CMIS aligns itself with available service and software vendors, it does not need special support and should immediately provide a workable gateway for access to these tools.

Bridging equipment (i.e., devices that allow communication between varieties of portable and fixed equipment such as radios and telephones) is currently being field-tested through a grant system and through industry-sponsored evaluation programs. Various types of bridging equipment are being introduced to the field in separate locations to be used during exercises and in real-life situations. In at least one location, two separate types of equipment will be in a common location for back-to-back testing.

No amount of communications equipment interoperability, however, will be successful without a workable communications plan. It is the hope of this SubGroup that it can influence various training facilities to develop a program designed to combine logic, discipline, and need-level identification that will be deliverable to the First Response Community.

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It is the opinion of the SubGroup that First Responders already do their various jobs very well, and the basic job doesn't change for a WMD event. The challenge is to work together in a coordinated team approach with a free and complete flow of information and intelligence. Lives and a way of life are at stake!

Detection and Decontamination SubGroup

MISSION

The InterAgency Board Detection and Decontamination SubGroup shall provide input, direction, standards, and information to First Responders on equipment for use in the WMD arena.

FUNCTION AND ROLES

The Detection and Decontamination (D&D) SubGroup consists of members from local, state, and federal agencies and industry representatives having expertise in WMD and Hazardous Materials (hazmat) incident response. The D&D SubGroup is responsible for addressing equipment identification, interoperability, and standardization in two complex areas of detection and decontamination: chemical warfare agents (CWA) and biological warfare agents (BWA). All SubGroup members provide input for development of the performance guidelines for detection and decontamination equipment. These guidelines are included as Appendix C.

INITIATIVES AND PROGRESS IN 2000

Overall, the D&D SubGroup endeavored during this year to keep its initiatives focused on its mission and wed to the idea that state and local equipment must be expected to operate for extended periods in the event of a WMD incident. During a recent meeting of the D&D SubGroup, for example, the mission statement was reviewed to ensure that it would drive future committee activities; namely to research and evaluate currently available detection and decontamination equipment for possible inclusion in the Standardized Equipment List. The mission statement also requires the SubGroup to raise the technology bar for currently available equipment that will challenge industry to develop and market better products. One example is a standoff chemical agent hand-held point detector that will keep the user safe by permitting detection without requiring the user to enter a toxic atmosphere for readings or samples.

In addition, it was the consensus of the SubGroup that the Department of Defense (DoD) is the expert in this field, based on its research capabilities, technology, and practical experience gleaned through agent production and usage in warfare. It was further agreed that the First Responder civilian community would be the first level of defense against domestic terrorist attacks, and that it would be expected to maintain stand-alone operations for several hours. Technical assistance and equipment resources through the DoD must therefore be brought on-line to assist in these extended operations. The SubGroup further agreed to place a higher priority on detection equipment since the determination of isolation zones (hot, warm, and cold) is the first step in the First Responder strategic hierarchy.

Specific initiatives over the course of the year include:

- *Equipment issues.* D&D SubGroup research indicates that some military equipment and a great deal of commercially available

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detection equipment may be ineffective in detecting low levels of chemical and biological warfare agents. Military equipment that is effective on the battlefield may not be effective in urban settings. Likewise, vendor claims of hand-held point detectors' detection capabilities or reliability did not prove out during field use by emergency response agencies. The SubGroup therefore recommends the creation of a testing and certification process to ensure product effectiveness and reliability. The need for dry decontamination systems in the form of electrostatic, sound wave, ultraviolet, or other technologies is desperately needed. The current aqueous applications for mass decontamination in cold weather climates are problematic from a physiological perspective.

At the 2000 Marshall Convention, the D&D SubGroup addressed Industry on current needs and performance requirements of detection and decontamination equipment necessary for military and civilian applications, stressing the need for economical, reliable, and user-friendly technology. During breakout sessions, SubGroup members met with detection and decontamination equipment vendors to discuss currently available equipment. The SubGroup provided desired performance specifications for future generations of detection and decontamination equipment and requested that vendors complete a questionnaire relative to their product(s) for SubGroup review.

Unfortunately, current equipment is limited, and the SubGroup has made very few recommendations this year for inclusion in the SEL. It found many cases in which detection levels were far above Immediately Dangerous to Life and Health (IDLH) threat levels and in which false positive readings occurred in the presence of various common background substances. Much of the decontamination equipment was cumbersome and expensive. For the future, the SubGroup intends to address performance and testing requirements prior to SEL inclusion in lieu of reliance on vendor or industry claims.

- *Testing protocol*. The D&D SubGroup sought to identify a voluntary testing protocol to validate hand-held chemical detection equipment. The SubGroup intends to require Industry or the vendor to absorb all costs of this voluntary testing. The SubGroup further believes this testing should be conducted at DoD testing facilities, such as the U.S. Army Soldier and Biological Chemical Command (SBCCOM), that can compare live agent testing procedures to the required performance specifications. Through the efforts of the Federal Co-Chair, the SubGroup is using the hand-held chemical agent test-and-evaluation procedure developed by the SBCCOM Domestic Preparedness Test and Evaluation Team. The SubGroup requested that this procedure be revised to include detection threshold values listed in parts per million or parts per billion vs. mm/m^3. Upon completion of this voluntary testing procedure and requirements by the SubGroup, this SBCCOM protocol will be adopted by the IAB. It is the intent of this SubGroup that this voluntary test-and-evaluation

procedure will be issued by the National Institute of Standards and Technology's Office of Law Enforcement Standards (NIST/OLES).

- *Search for international input*. Members of the D&D SubGroup are currently making arrangements to meet with foreign scientists in an effort to determine the existence and availability of technologies that could be used in the United States.
- *Domestic liaison*. In March 2000, a joint meeting of the D&D and PP&OE SubGroups was held in Las Vegas, Nevada, to ensure operability between the two disciplines, as levels of PP&OE requirements are based on detection and decontamination abilities. A white paper was prepared for review by the IAB membership that addressed issues and concerns pursuant to this end. Members of the D&D SubGroup also toured the Nevada Test Site at this time: impressed with the potential for future consortium training at this location, members consulted with the Site Training Director and forwarded training recommendations to the DoD Co-Chair of the IAB. D&D SubGroup Co-Chairs and the Federal Co-Chair also briefed Las Vegas firefighters on IAB activities and solicited their input for future WMD initiatives.
- *SubGroup reviews of ongoing initiatives*. SubGroup members reviewed and provided comment to the NIST/OLES on the *Guide for the Selection of Biological Agent Detection Equipment for Emergency Responders*. It was the opinion of the SubGroup that this guide was a very valuable resource for First Responders in making educated choices in selection and purchase of detection equipment. This guide is designed to help the emergency response community make informed decisions on the selection and purchase of commercially available biological detection equipment, itemizing technical considerations for biological detection, equipment and vendor information, as well as physical data that includes a photograph of the equipment. It also supplies a matrix that synopsizes equipment sensitivity, selectivity, and detection timelines.

  D&D SubGroup members also provided input to the Joint Service Individual Protection Commodity Area Manager during the development of the Individual Protection—Front End Analysis. This was accomplished through the efforts of the Federal Co-Chair and in conjunction with the efforts of the PP&OE SubGroup.

  The D&D SubGroup is carefully monitoring the efforts of the SBCCOM Improved Response Program's (IRP) Mass Casualty Decontamination Research Team (MCDRT). Several of the SubGroup's members and fire service representatives for cities that have cold climates are members of this effort. The MCDRT was formed to provide the emergency response community with an initial product that outlines the use of water flushing and showers from firefighting equipment such as pumpers and ladder trucks as a mass victim decontamination option. This report, entitled *Guidelines for Mass Casualty Decontamination During a Terrorist Chemical Agent Incident*, can be found on the Homeland Defense web site at

http://www.sbccom.army.mil/programs.com. The team conducted a literature review that showed little research had been conducted in areas of medical efficacy of specific skin decontamination methods, the prioritization of decontamination and medical triage of large numbers of chemical agent casualties, and on the magnitude and number of potential casualties resulting from a terrorist chemical event. It also determined that little research existed on the effects of wet decontamination impact on human physiology. Medical staff serving on the team expressed concern about the use of water for mass decontamination in climates with a temperature below 65°F. The team was challenged by the D&D SubGroup to develop a procedure for field use by incident commanders when wet decontamination is required in northern tier cities. On January 31-February 1, 2001, a Cold Weather Decontamination Panel (including SubGroup members) met to establish a basis for physiologically appropriate guidelines for the fire service for mass decontamination procedures in cold weather climates. It also received a presentation on hypothermia and technical support from the University of Minnesota.

- *Field-testing initiatives.* A member of the D&D SubGroup was sent to the Joint Field Trials #6, sponsored by the DoD Joint Program Office for Biological Defense, to observe the field-testing of several of the latest technologies currently under development for the detection of biological threat agents. The SubGroup member presented the results to the InterAgency Board members and used this information to upgrade the biological detection section of the SEL.
- *Deterrent and response planning at the state and local level.* SubGroup members have been engaged in the early phases of deterrent and response planning under the consequence management side of the WMD arena, noting that the SEL and other products developed by IAB members and the SBCCOM Improved Response Program provide a blueprint that can be used by state and local emergency response organizations and planners. Officials at all levels appear to accept their roles and responsibilities based upon the proven and tested methods of these products and the IRP. SubGroup members remain active in various committees at the state and local levels to enhance and promote counter-measure and response capabilities, and they frequently serve as advisors to the grant process, equipment selection, and procurement.

Standards Coordination SubGroup

MISSION

The Standards Coordination SubGroup shall serve as a facilitator to other commodity SubGroups to promote consistency by ensuring:

- No contradictory requirements for complementary equipment
- Requirements meet regulations, standards, and guidelines
- Notification of any similar or additional qualification requirements
- Expert technical and non-technical advice and support
- Facilitation of new regulations and standards for equipment not listed
- Promotion of harmonization of regulations, standards, and guidelines

FUNCTION AND ROLES

The role of the Standards Coordination SubGroup is to ensure that standards are in place to cover development, use, and certification of equipment listed in the Standardized Equipment List. Members of the Standards Coordination SubGroup assist other SubGroups in identifying existing standards that may be used—and also in facilitating standards development.

The importance of the Standards Coordination SubGroup cannot be understated. In the environment of emergency incident operations, emergency service personnel must have confidence that their personal protective ensemble and equipment will afford them a certain level of protection. It is critical that compatibility issues of equipment are addressed now, through nationally recognized standards, before the advent of multi-agency, multi-jurisdictional WMD incidents. The Standards Coordination SubGroup thus functions to prevent the response community from embarking on divergent paths to reach the same goal. It has the necessary expertise, at all levels, to reflect the work being done nationally.

To ensure that all agencies are working together to address common counterterrorism equipment issues, the IAB is facilitating the development of numerous Interagency Agreements (IAs) and Memoranda of Understanding (MOUs) between federal, non-profit, and private standards agencies. These agencies include NIOSH, NIST, OSHA, DoD, NIJ, SBCCOM, EPA, DOE, ANSI, and NFPA. These IAs and MOUs are critical to the development and use of standards and regulations in this arena.

INITIATIVES AND PROGRESS IN 2000

In the past year, the Standards Coordination SubGroup has:

- Developed "A Strategic Plan for Developing Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Equipment Standards" (Appendix D).
- Participated in development of a six-volume series of *Guides for the Selection of Equipment for Emergency Responders* (Detection Equipment-Biological, Detection Equipment-Chemical Agent and

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Toxic Industrial Material, Chemical and Biological Decontamination Equipment, Communications Equipment, Medical Equipment, Personal Protective Equipment).

- Developed a Memorandum of Understanding between NIOSH, NIST, NFPA, and OSHA for coordinated development of CBRN equipment standards.
- Assisted a Memorandum of Understanding between NIOSH and SBCCOM for development of CBRN respiratory equipment standards.
- Assisted InterAgency Agreements between NIST and NIOSH, and NIST and SBCCOM, to support the CBRN standards development process.
- Enlarged Standards Coordination SubGroup membership.
- Facilitated comments from their parent organizations on the *NFPA 1994 Proposed Standards for Chemical and Biological Personal Protective Clothing*.

FUTURE PLANS

In this coming year, the Standards Coordination SubGroup will:

- Identify existing test methods and standards that may be used for PP&OE, Detection and Decontamination—and the interoperability of that equipment.
- Provide liaison regarding testing methods and certification requirements including use, care, selection, inspection, and maintenance issues to standards-setting agencies and associations.
- Work with other SubGroups to develop basic minimum recommendations that build compatibility and interoperability for each type of equipment in the Standardized Equipment List.
- Work with other SubGroups to identify existing federal or consensus standards for each piece of SEL-listed equipment.
- Work with other SubGroups to identify existing equipment standards that need to be modified or adjusted for counterterrorism response.
- Work with other SubGroups to identify SEL-listed equipment that has no existing standards.
- Work with other SubGroups to define standards development priorities for SEL-listed equipment.

Issues and Initiatives

Disclaimer

Contributors' opinions do not necessarily reflect those of the InterAgency Board, individual members, or their respective agencies. While every effort has been made to ensure the following articles are timely and accurate, the InterAgency Board accepts no liability for errors or omissions.

Field of Empty Chairs

These 168 chairs stand as a poignant reminder of each life lost, articulated as the absence felt by family members and friends. The chairs are placed in nine rows, representing the nine floors of the building. The chairs are placed according to the floor on which those killed worked or were visiting.

The symbolic chairs are designed in two sizes, the smaller size representing the absence of 19 children. Each chair is crafted of bronze and stone; its glass base is etched with the name of the victim. By day, the chairs seem to float above their translucent bases. By night, the glass bases illuminate as beacons of hope.

Courtesy of the Oklahoma City National Memorial

Medical Issues and Initiatives

Phoenix Metropolitan Medical Response System Medical Component Overview: A Case Study

Tom Skowronski, City of Phoenix Fire Department

The Metropolitan Medical Response System (MMRS) in Phoenix, Arizona, is a complex constellation of components—each with a different focus and sometimes involving multiple agencies—designed to manage the consequences of terrorist incidents that use weapons of mass destruction. These components include medical surveillance, medical management, hazardous materials, law enforcement, and others. Although it is difficult to separate the components—their effectiveness depends upon their complete integration—this overview focuses upon the medical component of the Phoenix MMRS and how it achieves its two broad missions: The first mission addresses biological threats and involves epidemiological surveillance of the community to detect and subsequently respond to incidents associated with the release of a biological agent. The second mission addresses the medical treatment of victims of WMD incidents. A brief discussion of the medical system itself follows, in which mission-related performance by member organizations is described.

Structure and Function of the MMRS

The medical component of the Phoenix MMRS is coordinated through the Steering Committee and through subcommittees that are appointed by the Steering Committee (e.g., Hospital Subcommittee, Pharmaceuticals Subcommittee, Patient Care Subcommittee, etc.). The Steering Committee retains policy authority for the MMRS through the ascent of the organizations participating on the Committee. Since the MMRS is intergovernmental and multi-jurisdictional—and also involves private organizations—no single organization maintains statutory or agency authority over all participants. It is important to emphasize the MMRS structure and policy are in a constant state of change (managed by the Steering Committee). These changes reflect changes in the threat environment, changes in the state of medicine and technology, and changes in the resources and capability of MMRS participant organizations

When the Phoenix MMRS is activated by an incident (with or without a defined scene), response activity of all components, including the medical component, is managed in the Phoenix Emergency Operations Center (EOC), which is staffed by representatives of all MMRS organizations. Currently, the Phoenix MMRS is focusing on WMD events that are either located in Phoenix (or within the Fire Department mutual/automatic aid system) or that produce consequences for residents of Phoenix. The medical component of the Phoenix MMRS is responsible for four primary functions administered by different agencies, whose mission responsibilities are described below.

Medical Component Functions of the MMRS

The first general medical function of the MMRS involves planning, management, and delivery of emergency medical services and principally involves the Phoenix Fire Department (PFD). The PFD is linked with 26 other fire departments in the greater Phoenix area through mutual and automatic aid agreements; the capability to medically manage a WMD incident can consequently draw upon the resources of all these departments. The PFD serves as the central coordinator for several MMRS functions.

First, the PFD Emergency Medical Services Section coordinates with the Arizona Department of Health Services (EMS Bureau), the Arizona Emergency Medical Systems (AEMS) (regional EMS medical association), and the Samaritan Regional Poison Control Center on issues related to patient treatment protocol, medical management policy, and medical personnel scope of practice.

Second, PFD EMS section manages the MMRS Pharmaceutical Cache and System. The pharmaceutical cache includes pharmaceuticals and medical supplies maintained by PFD Special Operations, such as sufficient drugs and antidotes to treat a minimum of 1,000 citizen casualties and responder personnel who have been exposed to chemical and radiological agents and sufficient antibiotics to issue prophylactic doses to responder personnel. The pharmaceutical system is maintained by PFD EMS section; it is a computer listing of local and statewide drug wholesalers and retailers who can supply additional antibiotics, vaccines, and other pharmaceuticals for treatment or prophylactic use on citizens and responders. The capacity of the system to deliver (and the availability of) drugs to PFD is tested bi-annually.

Third, the PFD EMS Section maintains the training, continuing education, and certification of toxicology paramedics.

Fourth, the PFD EMS Section insures the availability of PFD paramedics who are trained to administer immunizations in the event the MMRS public health authorities deem mass immunizations appropriate.

Finally, with PFD Special Operations, the PFD EMS Section coordinates all training and response of EMT and Paramedic personnel for incident response, including patient emergency medical treatment, support of public health functions, support of medical examiner functions, and support of hospital operations.

The second general medical function performed by the MMRS addresses public health and principally involves the Maricopa County Public Health Department (MCPHD) and the Arizona Department of Health Services (DHS). The DHS State Laboratory supports agent identification with links to federal resources. The MCPHD, DHS Samaritan Regional Poison Control Center, and AEMS participate in disease consequence assessment, and they direct diagnostic and treatment protocols to be used in the MMRS. Diagnostic and treatment protocols are also disseminated to hospitals, health maintenance organizations, and private physicians

through bulletins, special training, and conferences conducted by DHS, MCPHD, Samaritan Regional Poison Control Center and AEMS. MCPHD and DHS (through the Arizona Health Alert Network) manage disease surveillance for biological threats. The PFD supports this surveillance effort by monitoring fire and police personnel illness/absence patterns and reporting them to the public health system. In the event a biological agent is identified, the public health system achieves identification, issues treatment guidelines, and determines (and orders) the need for mass prophylaxis. MCPHD maintains a system for administering mass prophylaxis. In the Phoenix area, the MCPHS system can be supplemented by PFD personnel (EMTs and paramedics) and by using fixed sites to distribute antibiotics or administer immunizations.

The third medical function, addressed by selected Greater Phoenix hospitals, focuses on providing extended medical treatment to victims of WMD incidents. This includes victims given emergency treatment and transported from a scene as well as victims from the broader community (exposed to biological agents). Hospitals' activities are coordinated through the MMRS Steering Committee and the Arizona Hospital and Healthcare Association (AHHA), a professional association to which all hospitals belong. Principal functions here include decontamination, diagnosis, treatment, and possible transfer of victims to the National Disaster Medical System (NDMS) for extended care. Patients transported from a scene are decontaminated prior to being moved by PFD personnel. In addition, all hospitals maintain a decontamination capability—supported, if appropriate, by specially trained PFD personnel and equipment. Hospitals are prepared to expand treatment capacity in keeping with AHHA plans to operate a Medical Aid Station system. Initial hospital medical personnel expansions will be undertaken by individual hospitals using disaster plans, and subsequently supplemented by a statewide personnel recall system maintained by the AHHA and based in the Phoenix EOC. Aid Station expansion will include creation of bed space on-site at hospitals as well as capacity to open, equip, and staff large centralized treatment sites at remote specified locations. Hospital physicians will determine if patients need to be transferred to the NDMS Patient Reception Center at Sky Harbor International Airport; these transfers will be accomplished through hospital ambulance arrangements and supplemented by fire department personnel and vehicles. Continuity of care at the Patient Reception Center is maintained in the NDMS plan through Luke Air Force Base medical personnel, supplemented by PFD (and other fire services) paramedics.

The fourth and last medical function concerns the management of fatalities. The Maricopa County Medical Examiners Office (MCMEO) manages this function. MCMEO plans establish expanded morgue facilities at Sky Harbor International Airport. MCMEO personnel and vehicles, supported by Maricopa County Sheriff's Office, PFD Special Operations personnel and vehicles, and the Arizona National Guard, will manage transfer of human remains from a scene and from hospitals. All human remains from a scene will be decontaminated at the scene;

those who die in hospitals will be decontaminated at the hospital prior to transport. Further management of the deceased will be overseen by MCMEO, supported by the Arizona Funeral Directors Association.

The preceding description of medical functions of the Phoenix MMRS is necessarily abbreviated and at best an overview. Details of the medical system and its integration into the MMRS may be found in the Phoenix MMRS: System Overview and in the Phoenix MMRS: Biological Response Plan. ■

PP&OE Issues and Initiatives

County of Los Angeles Fire Department Multi-Casualty Mass Decontamination Plan for the 2000 Democratic National Convention

Ronald D. Watson, Battalion Chief, County of Los Angeles Fire Department

In the year 2000, the Los Angeles Operational Area began preparations to host the Democratic National Convention (DNC). Emergency managers assessed the potential for acts of terrorism and factored in the massive influx of participants, tourists, and protestors (violent and peaceful alike). Law enforcement officials and other crisis managers assessed their particular challenges. Fire officials and consequence managers likewise began their preparations. Among these, the County of Los Angeles Fire Department began an aggressive training program to provide all of its 2,800 uniformed personnel advanced instruction in Multi-Casualty Mass Decontamination (MCMD), recognizing that this training would be essential if a terrorist release of a chemical or biological agent occurred.

Baseline Situation

The 14 fully-staffed hazardous materials task forces in Los Angeles County were recognized as expert in performing decontamination procedures on their own technicians and on anywhere between 1 and 10 victims with their existing resources and training. They were, however, not prepared, equipped, or staffed to decontaminate large numbers of people. Moreover, in a catastrophic situation, hazardous materials technicians would be consumed with tasks specific to their operation (detection, mitigation, etc.).

Recognizing this potential shortfall in service delivery, the MCMD training program was created to address the issue. All uniformed personnel were required to participate in training that focused on the immediate delivery of decontamination procedures.

The MCMD Training Course

The MCMD training course was designed to be delivered in one 8-hour session that incorporated an equal amount of didactic and manipulative instruction. All Los Angeles County Fire Department personnel completed their training in a 3½-month period, concluding just prior to the commencement of the DNC.

The course was written by local fire department WMD specialists and was reviewed by members of the InterAgency Board for Equipment Standardization and InterOperability. In addition, it relied strongly on SBCCOM's CW-IRP "Guidelines for Mass Causality Decontamination During a Terrorist Chemical Agent Incident," dated January 2000. This comprehensive decontamination document emphasized decontamination methods that could be performed with equipment and expertise readily available to most responder jurisdictions. This "national" interaction from First Responder peers from across the nation allowed the course developers to keep abreast to problems, concerns, and innovations

specific to the decontamination process that had already been encountered by others.

The MCMD training course emphasized *safety* as the framework for all activities and tasks conducted within any MCMD operation, its goal always to provide complete and effective decontamination assistance to victims so that they could be transported to the hospital for definitive care.

The MCMD Plan

The County of Los Angeles Fire Department MCMD Plan is a labor intensive and equipment-laden operation. All MCMD equipment is kept in one response vehicle in a facility centrally located within Los Angeles County. When deployed, it is staffed by personnel trained in decontamination procedures, each wearing appropriate personal protective equipment to address the specific contaminant.

The MCMD Plan sets up a series of inflatable tents that are relatively easy to maneuver. Each of the 15 ft. x 15 ft. tents are strategically placed so as to provide ambulatory and non-ambulatory victims an area of refuge and relief for contaminant removal; modesty protection for disrobing; and an area for donning clean clothing before exiting the decontamination operation.

Beyond treating contaminated victims of a chemical/biological exposure, firefighters are also trained to keep a heightened sense of their surroundings, to bag and secure victim clothing (for potential use as evidence in law enforcement matters), and to maintain chain-of-custody procedures through proper material management. Because of the volatile and tenuous environment of a mass casualty incident where an act of terrorism may be suspected, the MCMD operation depends on law enforcement assistance to achieve a safe operation.

There are multiple law enforcement missions/needs with separate requirements and personal protective equipment postures within a MCMD operation, a WMD, or terrorist incident.

General Patrol

- Escape hood or mask (with communication/voice amplification)
- Threat Alarm (e.g. chemical/radiological detector)
- Additional personal protective equipment is needed for Force Protection or special mission tasks

Tactical (Special Ops/SWAT)

- Primary Level C/Limited Level B
- Respiratory Protection ranging from APRs to PAPRs to SCBA with communication/voice amplification
- Splash Protection
- Interface with ballistic protection, need for mobility essential, and weapon systems decontamination issues

Crime Scene (Evidence)

- Primary Level C/Limited Level A or B
- Respiratory Protection ranging from APRs to PAPRs to SCBA with communication/voice amplification
- Splash Protection
- Interface with ballistic protection, need for mobility essential, and weapon systems decontamination issues

Bomb Squad/EOD

- Primary Level B or C/Limited Level A
- Respiratory Protection ranging from APRs to PAPRs to SCBA with communication/voice amplification
- Splash Protection
- Interface with blast protection, need for mobility/dexterity essential

Force Protection

- Primary Level C/Limited Level B
- Respiratory Protection ranging from APRs to PAPRs to SCBA with communication/voice amplification
- Splash Protection
- Need for mobility is essential, interface with ballistic protection, weapon systems decontamination issues

Data Provided By Sergeant John Sullivan, Los Angeles Sheriff's Department

Law Enforcement Interface Case Example

SBCCOM's CW-IRP recently completed a comprehensive program with the Maryland State Police (MSP) Special Tactical Assault Team to evaluate protective clothing and equipment for tactical law enforcement operations in situations where chemical threats are anticipated. These include chemical terrorist laboratory raids, capture of chemical terrorists, and hostage rescue in a chemical environment (the IAB PP&OE SubGroup is also assessing Force Protection issues in regard to law enforcement missions). The program also addresses procedures and tactics that will help law enforcement personnel survive attacks of chemical warfare agents. A variety of commercial and military PPE ensembles were evaluated during actual exercises by MSP officers in a building that was converted into a simulant vapor threat-testing chamber. The results of this program will be made available through the InterAgency Board and the SBCCOM web site in early 2001 and will include protection factor data that can be used to select chemical protective systems for tactical law enforcement operations.

Mass Decontamination Procedures

Personnel in a MCMD operation use a simple water delivery system that starts with an engine pumper and hydrant water and ends in a multi-outlet manifold reduced to a 1-inch diameter hose. Personnel inside the decontamination tents wash contaminants off the victims using hand-held spray wands. A Health Officer and Medical Director are assigned to offer direction on what specific decontamination solution should be used. ("Regional" challenges that exist for those developing similar decontamination systems include addressing "cold water" conversion and/or patient hypothermia).

It is important to note that there are no absolute standards for decontamination procedures, only guidelines. The type(s) and level(s) of protective clothing may vary from agency to agency, and the levels(s) of protective clothing may vary depending on the chemical(s) involved. Nevertheless, the decontamination procedure should follow a logical order. Personnel should move from contaminated to uncontaminated areas. This action/operation will best permit definitive care to victims. The ultimate design goal in developing a mass decontamination system is to protect citizens, personnel, equipment, and the environment from harmful effects of the contaminants. Decontamination minimizes the uncontrolled transfer of contaminants from the hazard site to clean areas.

PPE Future Vision

A Post-Modern Knight's Armor

To defend against terrorism and asymmetric warfare, First Responders—much like knights on medieval battlefields—will be required to suit up in appropriate armor—now known as personnel protective equipment.

A post-modern "knight's armor" needs to protect against all the old threats, including ballistic threats from small arms and explosive blasts, but it must also protect against new dangers, such as chemicals (warfare and toxic industrial varieties), biological agents and toxins, radiological and nuclear sources, cyber and laser threats. Not only should this new set of armor protect, but it must also allow the wearer to conduct a whole range of response activities: reconnaissance, rescue, triage, treatment of the injured, force protection, and traditional counter-force activities.

Ideal modern armor would actively sense the environment for the range of possible threats while monitoring the wearer's biosystems and location. When it sensed a threat agent or mechanism, it would automatically alert the wearer, detect and verify the actual threat agent, and activate the appropriate counter-measure. Counter-measures could include erecting a barrier or protective envelope that would exclude the hazard—or automatically apply prophylaxes or antidotes that would counter harmful bioeffects. Ideal modern armor would continue to monitor the external environment and the internal wearer, relaying vital measurements in real-time to appropriate command and control personnel. All would occur in real-time using nanotechnology that would make the integrated array of equipment light, unobtrusive, and affordable.

Only when this vision is realized can First Responders in a post-modern community safely and effectively protect the nation from threats across the technological spectrum. ■

Conclusion

Fortunately, the County of Los Angeles Fire Department's MCMD preparations for the Democratic National Convention were not tested by terrorist events. At the same time, however, its training plan and operational procedures have significantly improved its ability to address any future mass casualty incident, either accidental or purposeful in nature.

Terrorism, although a real and present threat to the safety of our citizens, is truly a low frequency occurrence. Yet, the intricate highway and railroad systems that traverse their way through the highly populated Southern California area provide an adequate theater for auto/truck and rail accidents and the release of any number of hazardous materials and other contaminants. A mass decontamination plan should be part of any First Responder agency's emergency response plan. Fire, law enforcement, and health care agencies alike must work together to make such a plan come to fruition. ■

Battalion Chief Ron Watson is the Terrorism Preparedness Coordinator for the County of Los Angeles Fire Department and co-chairs the IAB's Personal Protective and Operational Equipment (PP&OE) SubGroup.

S&T Issues and Initiatives

Report on New Technology: Using the Nationwide Differential Global Positioning (NDGPS) System for Interoperability and Incident Management

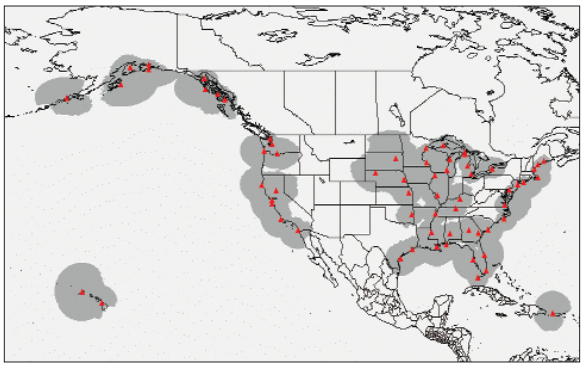
Commander Gail P. Kulisch, U.S. Coast Guard, Commanding Officer
Atlantic Strike Team

In as little as five years, an extensive nationwide system of precise positioning will be built throughout the United States and Puerto Rico that will transform the public safety sector's ability to protect U.S. communities. The Coast Guard developed, built, and operates the fully operational Maritime DGPS Service, and it is currently developing the Department of Transportation's Nationwide DGPS Service. Among its specifications, NDGPS will provide service identical to the present USCG Maritime DGPS with double signal coverage on the continent. Although the stated accuracy is 10 meters in all coverage areas, the typical positioning accuracy is 1 to 3 meters. Higher-end receivers achieve even greater accuracies. When completed, the system will consist of 120-140 sites, several of which are converted sites from the Air Force's demobilized Ground Wave Emergency Network (GWEN). The Coast Guard operated system ensures a known accuracy level, availability of the signal in designated coverage areas, and will warn users when the satellite signal should not be used. This system has a data transmission rate of 200 bps (minimum field strength is 100 microvolts per meter); is a digital modulated minimum shift key subcarrier on marine radio beacon frequencies in the 283.5 to 325 kHz (LF/MF) band; and is formatted using RTCM SC-104 version 2.1. The public can access additional information about NDGPS, and track the status of its development, on the U.S. Coast Guard's Navigation Center's website at www.navcen.uscg.mil.

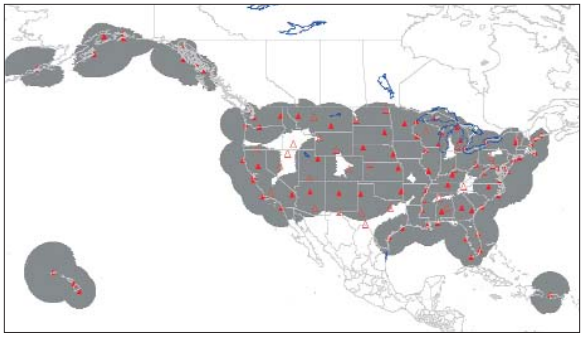
Although it is being developed for critical safety-of-life surface transportation applications, NDGPS has many applications for both industry and public safety concerns.

- Weather forecasting has already benefited as NDGPS stations are integrated into the GPS Integrated Precipitable Water Vapor System for improved predication of severe weather such as tornadoes.
- Precision farming has allowed accurate mapping of crops and soil, and precision guidance of crop dusters and vehicles applying chemicals have lowered the costs and reduced hazardous run-off.
- Charting, mapping, and surveying functions obtain centimeter-level positioning accuracy through the Continuously Operating Reference Stations (CORS).
- NDGPS will make possible Positive Train Control (PTC), one of the National Transportation Safety Board's "Most Wanted" initiatives.
- DGPS is part of the Marine Transportation System infrastructure that binds the nation's waterways and ports to railroads, roadways, and pipelines.
- It has significantly improved the safety of marine transportation in the nation's harbors and near-shore waters.

- Police, fire, ambulance, and rescue coordinators will be able to cut response time and save lives and property using computer-aided dispatching and on-scene management of resources through passive tracking of assets.
- NDGPS can help locate fire hydrants, signs, and critical public safety infrastructure even in low or zero visibility, such as at night or in severe weather.
- Many civilian "timing" uses, such as telecommunications that use GPS for synchronization, will receive a more precise timing service from the modernized GPS.
- Perhaps above all, for the IAB's purposes, interagency coordination and on-scene management of disasters would be improved by using this technology to get precise positioning information to the Incident Commander.



U.S. Nationwide DGPS Coverage as of 2000



Planned U.S. Nationwide DGPS by 2001

These are only some of the applications that have been implemented or envisioned for this new technology. The public safety sector will continue to identify ever more benefits of this precise, constant positioning service. Similarly, equipment standardization and interoperability must keep pace with the many applications being developed for NDGPS. ■

ICIS Issues and Initiatives

Summary Report on Public Safety Communications Interoperability: A First Responder Perspective

Christopher Lombard, City of Seattle Fire Department

What follows are excerpts from a white paper that is being developed by the Interagency Board's SubGroup for InterOperable Communications and Information Systems. The author was requested to provide a brief for the Attorney General of the United States on the status of public safety communications, who the affected agencies are, and possible courses of action to improve on them, all from a First Responder's perspective.

The complete report (including more detailed descriptions of "public safety players," references, recommendations, etc.) will be made available, upon completion, from the InterAgency Board for Equipment Standardization and InterOperability.

Background

The ability of public safety agencies to communicate information has always been imperative, whether they are federal, state or local, law enforcement, fire or EMS, but never more so than today with WMD threats in the offing. Whereas in the past information was communicated verbally, today it is conveyed as a mix of data and voice, soon to be all data (because voice will be treated as data – example: Voice Over IP). Information and knowledge are perhaps the two most critical tools towards accomplishing public safety's crisis management and consequence management goals. The ability, or inability, to communicate information from the onset of significant events will determine the outcome. This is especially apparent in the mitigation of a WMD event.

Today, most federal, state, and local public safety communications organizations use similar equipment. They rely on portable, mobile and/or base radio systems and their associated infrastructures. But even though they use similar communications systems, there are some major hindrances in intercommunications between them. Some obstructions occur because equipment/users are assigned to different frequency bands of the EM spectrum and because the hardware can't bridge between the different frequency bands. Some minor hindrances occur because of different communications protocols, different encryption schemes, different proprietary systems, and more.

In the metropolitan areas of our country, where federal, state, and local public safety groups simultaneously operate, similar but distinct communications infrastructures are in place. This duplication, or multiplication, of efforts is, at best, costly and grossly inefficient. To make matters worse, many systems lack security, leaving them open for interception, interruption, and monitoring. Today, it goes without saying, scanning equipment is readily available to *everyone!*[1]

Government Standardization Initiatives

In 1993, the Clinton administration, under the direction of Vice President Al Gore, led an initiative to "reinvent" government. The objective was to eliminate many of the inefficiencies within the federal government and to try to operate more like a "business." One of the primary means of accomplishing this project began with a National Performance Review (NPR). At the conclusion of the review, the federal government developed a list of 1,200 actions and recommendations that it believed would improve overall efficiency. Many of the recommendations involved information technology implementations and incorporation.[2]

Since 1993, the National Performance Review (which became the National Partnership for Reinventing Government in 1998) has developed initiatives to tackle areas in need of reform. It has mobilized staff and resources across government to study issues and take action. Some of its initiatives have been spun off to appropriate agencies for implementation as reinvention began to take hold.[3] Some of the current initiatives include Access America, Benchmarking, High Impact Agencies, Plain Language, and Reinvention Labs and Waivers.

A few of the 1,200 action items listed in the NPR have begun to have large impacts on public safety communications. Two of them include:

- IT04 – Establish a National Law Enforcement/Public Safety Network
- A06 – Establish The Intergovernmental Wireless Public Safety Network.

IT04 – The implementation of IT04 involved several federal departments. In 1995, the National Telecommunications and Information Administration (NTIA), part of the Department of Commerce, mandated that federal radio users begin the transition to more spectrally efficient (digital narrowband) radio systems. At about the same time, the Federal Communications Commission (FCC) began addressing the same issue for both state/local public safety and law enforcement agencies. The Association of Public Safety Communications International, Inc. (APCO) also began sponsoring a federal, state, local, and industry effort to develop technical standards for the next generation narrowband digital radio systems – Project-25 (P25).[4]

IT04's goal is to replace all federal government radio systems with digital technology (this effort began eight years ago and will continue over the next five years), but not on an agency-by-agency basis, as was done in the past. Why? Because the cost would be enormous and the same problems with interoperability would reoccur, resulting in costly redundancies of equipment and staffing. Current budget conditions make it especially critical that the federal law enforcement, public safety, and disaster response agencies coordinate the transition to digital narrowband systems. Only through a coordinated approach will the cost savings be realized and will the serious interoperability problems of the past be overcome.[5]

To achieve this goal, all federal "players" sought to develop a shared infrastructure, called the National Law Enforcement/Public Safety Wireless Network.

The first group of these "players" was the Federal Law Enforcement Wireless Users Group (FLEWUG), a joint Treasury-Justice Department initiative formed in 1994 to plan and coordinate future shared-use wireless telecommunications systems and resources. The second group was the Communications Interoperability Working Group, drawing together the Department of Defense, Coast Guard, and federal law enforcement agencies under the auspices of the Office of National Drug Control Policy. This group began by defining minimum baseline requirements for secure, interoperable federal radio systems.

These initiatives ultimately led to the formation of the Public Safety Wireless Advisory Committee (PSWAC) and the Public Safety Wireless Network (PSWN).

A06 – Vice President Gore's 1997 report addressed this initiative in "Access America: Reengineering Through Information Technology," which captured his vision of using information technology to deliver comprehensive government services to Americans and to dramatically increase government productivity:

"The September 1993 National Performance Review report recognized the need for improving public safety communications capabilities. The report highlighted the need to address key challenges, such as competition for limited radio spectrum, limited public safety budgets, and keeping pace with advances in technology. The National Performance Review recognized that if public safety agencies coordinated their efforts in developing future systems, they could conquer those challenges, greatly enhance their abilities to fight the war on crime, and save money in the process."[6]

Back in April 1994, the Secretary of Treasury and the Attorney General had signed an agreement that established the Federal Law Enforcement Wireless Users Group, making it responsible for the development of a nationwide wireless telecommunications network for use by federal, state, and local law enforcement officials. A Management Plan was then developed and used to obtain Congressional support and funding for the program. Funding became available in FY 1996, and the FLEWUG opened the Public Safety Wireless Network Program Management Office. FLEWUG co-chairs and members actively participate on the government-wide Public Safety Wireless Advisory Committee.[7]

In September 1996, the joint FCC/NTIA-PSWAC validated the underlying need for establishing the intergovernmental public safety wireless network. Its report concluded, "Unless immediate measures are taken to alleviate spectrum shortfalls and promote interoperability, public safety agencies will not be able to adequately discharge their obligations to protect life and property in a safe, efficient, and cost effective manner."[8]

Conclusion

Today the effort to coordinate interoperability between federal agencies is well underway. As the effort to incorporate the state and local levels of public safety communications begins, the IAB hopes to facilitate a direct communications link between federal and local agencies.

Again, it is not a matter of if, but rather when the next WMD event will take place. Continued work in improving the interoperability of communications at all levels of government needs our collective, continued support. ■

[1]Final Report of the Public Safety Wireless Advisory Committee (PSWAC), September 11, 1996, page 2. (November 30, 2000).

[2]Vice President Al Gore, National Performance Review – Introduction.

[3]National Partnership for Reinventing Government, http://www.npr.gov/initiati/index.html.

[4]For additional information on APCO's Project 25, refer to APCO's website: http://www.apcointl.org/and follow any relevant links to P25.

[5]National Performance Review, reports, http://www.npr.gov/library/reports/it04.html.

[6]The NPR review (Access America), http://www.accessamerica.gov/reports/wireless.html (December 14, 2000).

[7]NPR review (Access America), http://www.accessamerica.gov/reports/appndxc.html (December 15, 2000).

[8]Final Report of the Public Safety Wireless Advisory Committee (PSWAC), September 11, 1996, page 2. (December 15, 2000).

ICIS Issues and Initiatives

A Cooperative Vehicle for Threat Assessment A Case Study: Los Angeles County Terrorism Early Warning (TEW) Group

John Sullivan, Sergeant, Los Angeles Sheriff's Department, Emergency Operations Bureau

To defend against contemporary threats and acts of terrorism in today's post-modern society, Los Angeles County's Terrorism Early Warning (TEW) Group developed a model—a cooperative vehicle for threat assessment—that would enable "First Responder" and "Follow-On" response agencies to obtain and assess the information and intelligence they would need to formulate an effective response to specific incidents. This article describes that interagency indications-and-warning and net assessment model.

The Threat: Post-Modern Terrorism

Terrorism in the post-modern era is characterized by a variety of actors willing or capable of using violence towards achieving their ends. These actors include networked organizations. They may have a religious nexus; they could include what were formerly known as rogue states; they could involve facets of transnational organized crime. Their use of asymmetric warfare and their proliferation of weapons of mass destruction (including chemical, biological, radiological, nuclear and explosives—CBRNE agents) could create an era where a "blurring of crime and war" could threaten U.S. interests both domestic and international.

In this threat environment, disruption and emerging threats could be as important as—or more important than WMD issues. Only a high degree of interoperability among all levels of responders—local, state, federal—between a variety of disciplines (law enforcement, fire service, public health and medical), and between civil and military agencies will provide an effective response. Intelligence is also an important element of forging an interagency response.

Formation of the Terrorism Early Warning Group

The Terrorism Early Warning Group, known as the TEW, was established in 1996 to address the challenges of CBRNE incident response in Los Angeles County. It first defined its challenges, to include: recognizing an attack (or outbreak) has occurred; lack of WMD knowledge/experience; lack of PPE and doctrine; security/crowd control issues; issues of quarantine; staffing/resources demands; and speed of the decision cycle. It further defined situational factors that could complicate response, to include: no discernable signature in an intentional attack; delayed recognition of terrorist nexus; the presence of fog, friction, and noise. The TEW then developed a networked approach, integrating law enforcement, fire, health, and emergency management agencies, to address the intelligence needs for terrorism and critical infrastructure protection.

Los Angeles County Terrorism Early Warning Group

Mission

To monitor trends and potentials that may result in terrorist threats or attack within Los Angeles County. This early warning group evaluates open source data and researches threat information to guide training and planning efforts and to support fire service and other emergency response efforts. The TEW works to identify precursor events, when assessing trends and potentials, with an eye toward prevention and mitigation.

Goals

- To identify potential terrorist attack and protect critical infrastructure through advance analysis of strategic and operational information.
- To assess open source intelligence to forecast trends and potentials. TEW's focus is early detection of emerging threats, including acts that use weapons of mass destruction such as chemical, biological, radiological or nuclear agents, and information warfare (IW or cyber-terrorism). It supports the County Emergency Operations Center (CEOC), the interagency Terrorism Working Group, and the Los Angeles County Metropolitan Medical Response System. It is coordinated by the Sheriff's Emergency Operations Bureau, which serves as the group's permanent secretariat.
- To provide a platform for networked, multilateral, horizontal communication of the threat information and intelligence needed to manage a complex urban operation. Its Net Assessment Group provides all-source fusion to act as an "Operations/Intelligence Fusion Cell" with an emphasis on future operations.
- To bridge the gap between crisis action planning and deliberate planning, providing the information necessary to achieve interoperability for complex, interagency, interdisciplinary, coalition-type operations.

Objectives

- To provide Indications and Warning (I&W), including ongoing disease surveillance;
- To perform Net Assessments to gauge the impact of a specific threat or attack and to develop viable courses of action to respond to an attack.

Strategies

- A networked approach to threat assessment, decision support, and course-of-action development.
- Use of standardized "Intelligence Preparation for Operations (IPO)" products to build situational awareness and provide a common operating picture for the interagency response community. Typical IPO products include i) Playbooks, ii) Target Folders, iii) Mission Folders (see "Intelligence Preparation for Operations" article).
- Activation of a Net Assessment Group to assess incident consequences.

Action Plans

During a known threat period or in the aftermath of an attack, the TEW will actively monitor and assess situational awareness and status of all events that may impact the Operational Area. In addition, it will employ advanced technological means (Forensic Intelligence Support) to facilitate situation assessment and course-of-action development for the public safety community.

The TEW (either actual staff or a "virtual" capability) will monitor key public gatherings, the status of emergency services, and the status of all infrastructural components. It will assess the impact of actual attacks both within and without the Operational Area in order to gauge resource needs and shortfalls and to develop potential courses of action to support incident resolution.

To prepare for an actual operation, the TEW will 1) support the unified incident management structure of the response community, 2) experiment with new technology, tools, and analytical frameworks to improve support, and 3) develop improved methodology to achieve its net assessment mission.

After integrating local-federal echelons, the TEW Group determined that its service would be activated under the following circumstances and would operate pre-, trans-, and post-incident:

- Threat or Hoax
- Agent or Device Found (pre-release)
- Agent or Device Found (post-release)
- Suspicious Outbreak of Disease
- Special Events with Threat Potential

The TEW exploits a variety of tools and resources to provide accurate situational recognition to the unified command and decision-makers. These include the use of "virtual reachback" top technical specialists and "Intelligence Preparation for Operations," including standardized response information folders (Playbooks & Target Folders). The TEW is also actively involved in technology exploration (modeling/gaming, mapping, expert C4ISR systems) to support Course of Action (COA) development and the generation of incident-specific Mission Folders. It further relies upon open source intelligence (OSINT) for scanning/monitoring trends and potentials that influence training and doctrinal needs. Additionally, during an actual threat period or attack, the TEW provides consequence projection (forecasting) to identify potential courses of action to the Unified Command Structure.

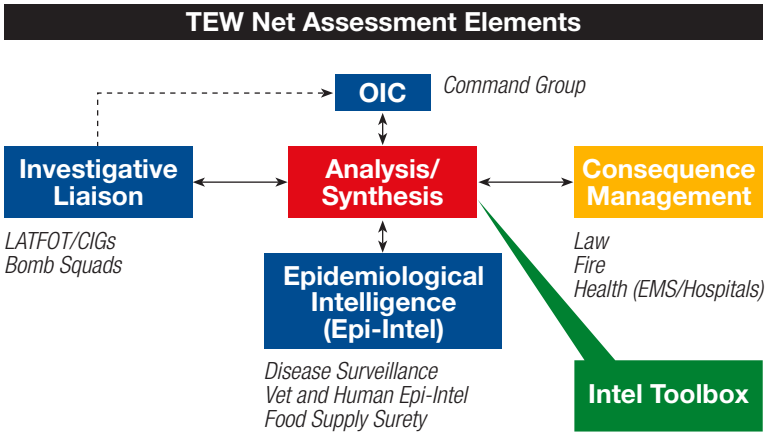
The Los Angeles Sheriff's Department's Emergency Operations Bureau (LASD EOB) acts as the TEW secretariat. Core members include: the Los Angeles Sheriff's Department, Los Angeles Police Department, Los Angeles County Department of Health Services, Los Angeles City Fire Department, Los Angeles County Fire Department, Los Angeles County Coroner, Los Angeles World Airports-Airport Police Bureau, the Long Beach Police Department, and the Federal Bureau of Investigation (Los Angeles Division). U.S. Customs, U.S. Coast Guard, Los Angeles County Office of Emergency Management, California Office of Emergency Services, RAND Corporation, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, National Law Enforcement and Corrections Technology Center-Western Region, California State University-San Bernardino, and a variety of state and local agencies also participate.

Activating the TEW: Net Assessment Mission and Model

During an actual event, the TEW activates a Net Assessment Group to determine the scope of the event and its impact on the Operational Area.

> **Net Assessment Mission:** As directed, the TEW will provide Unified Command Structure (UCS) with the impact of an actual attack on the operational area, gauge resource needs and shortfalls, continuously monitor and assess situational awareness/status, and act as the POC for inter-agency liaison in order to develop options for courses of action for incident resolution.

For Net Assessment functions (see graphic), the TEW is organized into Command/OIC, Analysis/Synthesis, Consequence Management,



Investigative Liaison, and Public Health/Epidemiological Intelligence (Epi-Intel) cells. These are supported by the "Intel Toolbox," which includes such external resources as virtual reachback or Forensic Intelligence Support.

- The Command/OIC cell is responsible for interacting with the incident command elements.
- The Analysis/Synthesis cell coordinates net assessment activities, tasking requests for information to the various net assessment cells and developing their results into potential courses of action, which are expressed together with incident-specific information into a mission folder.
- The Consequence Management cell assesses the law, fire, and health (EMS-Hospital) consequences of the event.
- The Investigative Liaison cell coordinates with criminal investigative entities. The Epi-Intel cell is responsible for real-time disease surveillance and coordination with the disease investigation.

The TEW in Action: Lessons Learned

The TEW has been activated four times to date: 1) to support operations during the series of anthrax threats in Los Angeles, 2) during the five-day, joint local-federal "Westwind" WMD exercise in February 1999, 3) during the Y2K/New Years 2000 transition, and 4) most recently during the Democratic National Convention (DNC 2000) Contingency in August 2000. During the DNC 2000 Contingency, the TEW's objectives included:

- Supporting the Unified Command at the County Emergency Operations Center, the LASD Department Operations Center, and the Joint Operations Center.
- Experimenting with new technology, tools, and analytical frameworks.
- Improving methodology for Net Assessment.

Benefits of activating the TEW during this period included: having an actual scenario to drive events; being opposed by a live networked force (OPFOR); dealing with multiple command pathways/organizational

entities; reaping real consequences; experiencing a real decision cycle; and having an opportunity for team/trust building.

During the DNC 2000 contingency, the TEW also exercised a "Forensic Intelligence Support" (FIS) element as part of the "Intel Toolbox." This element essentially provided the technical support necessary to develop "Ground Truth," a "Common Operating Picture," and to assess technical means. The integration of forensic intelligence into the TEW net assessment process demonstrated the efficacy of technological tools in speeding the decision cycle, reducing ambiguity (friction, fog, and noise), and supporting decision-making.

Another TEW-sponsored FIS capability that was activated for the DNC 2000 Contingency was a Field Assessment Support Team (LASD-sponsored field chem/bio lab capabilities). This, in effect, integrated components of the Lawrence Livermore National Laboratory (LLNL) Forensic Science Center, the California National Guard's 9th Civil Support Team's Mobile Analytical Laboratory System, and the LASD Crime Lab. Technology employed included solid phase micro-extraction (SPME) chemical sampling, a field expedient gas chromatograph/mass spectrometer (GC/MS), plume models, and visualization tools.

During the DNC 2000 Contingency, the TEW and FIS conducted a series of exercises (4 chem/2 bio) to simulate and hone decision support. They used plume models/visualization tools like Virtual Planner (multiple venues/multiple agents) from Los Alamos National Laboratory (LANL) and NARAC reachback from LLNL. In addition, they tested Target Folders (digital versions for key venues of concern) and the Virtual Emergency Response Training System-VERTS (3D Visualization) from the Institute for Defense Analysis and integrated with aerial imagery. Finally, they tested the potential of a cyber intelligence mapping project with the National Law Enforcement and Corrections Technology Center-Western Region, using OSINT tools for mapping OPFOR capabilities and intentions.

During this operation, the TEW adopted a Future Ops Focus (to deconflict functions with other intelligence modes). Also, a Standard Intelligence Report, Intelligence Summary, and Open Source Intelligence Report were developed, tested, and accepted for use during the activation. A series of Advisories (regarding operational security-OPSEC & Tactics, Techniques and Procedures -TTPs) were issued. To assist in forecasting the Event Horizon, OPFOR COAs were analyzed—and decision points, the projected main effort, and alternative main efforts were identified.

Outcomes and Conclusions

During the DNC 2000 Contingency, the TEW model was well tested. Its performance under real time conditions demonstrated that the WMD/Terrorism-based model could also be used for a Public Order event. This overall experience illustrated the value of a networked response to networked threats. The collaborative nature of the TEW operation served to narrow information seams and organizational gaps

within the emerging multi-organizational network that came together to manage the event; in addition, technology and all source fusion supported the decision process. Finally, a team was developed and trust earned, nurturing a mechanism that is designed to forge interoperability. ■

ICIS Issues and Initiatives

Intelligence Preparation for Operations: Developing Tools to Support Decision Making in Specific Incidents

John Sullivan, Sergeant, Los Angeles Sheriff's Department, Emergency Operations Bureau

To respond as an effective unit to complex urban operations—including CBRNE terrorism, natural disasters and public order situations—commanders from local, state, federal, and military agencies need timely access to accurate information. To acquire accurate information, they must rely on net assessment of threats, real-time situation status reports, and adequate intelligence preparation.

Only by building a "common operating picture" from these sources can commanders of both First Responder and follow-on forces synchronize their efforts and ensure interoperability.

To that end, the ICIS SubGroup has been working with local response agencies and Consequence Management Interoperability Services project specifically on intelligence preparation for operations: building a standard toolset for situational recognition, course-of-action development, and response rehearsal. These tools bridge the gap between deliberate planning and crisis action planning for all facets of a unified multi-organizational response organization.

Tools for Decision Making

The cornerstone of the toolset is the Mission Folder Function Group, a package of standardized playbooks, target (response information) folders, standardized intelligence reports and a standardized "Mission Folder" for sharing incident information. It organizes and displays information in an easy-to-follow, standard format, designed to minimize ambiguity and speed the decision cycle.

"Mission Folders" are incident-specific, combining pre-incident intelligence preparation (playbooks and target folders) with threat information.

Playbooks: Pre-planned general guidance for use in complex situations, such as a chemical or biological attack. Playbooks are threat specific and can be developed for each echelon of response or threat assessment.

Target Folders: These comprehensive references are venue-specific. They serve as a decision-making tool to guide an integrated emergency response to a specific, high-profile target within a specific jurisdiction. A target folder would include site plans, terrain analysis, interior and exterior plume dispersal models, blast analysis, maps indicating vulnerable points, potential sites for incident activities, etc.

The "Mission Folder" is designed to provide the Unified Command Structure (UCS) field IC, staffs at Operation Centers, and commanders of follow-on resources with the detailed intelligence information, situation and resource status, scene/location information, and a general

concept/COAs for making decisions that will resolve a complex incident. It should include:

- Written situation brief.
- Clear, concise mission statement.
- Clearly worded (recommended) commander's desired end state.
- ROE, restraints, constraints, assumptions.
- Resource availability/capability matrices.
- Complete intelligence annex.
- Collection plan worksheet.
- Target Folder (if available, otherwise develop spontaneous folder from template).
- Archival/technical information.
- Maps/schematics/photos/IPO templates.
- Investigatory status.
- Intelligence estimate (for the next operational period); including intelligence summaries/situation reports to date.
- Detailed potential courses of action. ■

ICIS Issues and Initiatives

ICIS Future Vision: Linking Emergency Responders Through a C⁴ISR Platform

John Sullivan, Sergeant, Los Angeles Sheriff's Department, Emergency Operations Bureau

As the United States faces the prospect of future conflicts and complex humanitarian emergencies in city and other civil settings, it must lay in an integrated and flexible response infrastructure that includes a Command, Control, Communications, Computer, Intelligence, and Situational Recognition (C^4ISR) platform that will create total communications and information interoperability among the entire coalition of emergency responders. The unified command and key responders of law enforcement, fire service, medical, public health, emergency medical, emergency management, hazmat and bomb squad personnel from local, state, federal, and military agencies must have a "common operating picture" in the complex operational space of a critical event. Such a "common operating picture" must provide a rapid, robust, accessible, easy-to-use mechanism for exchanging critical information. To avoid ambiguity and to aid situational recognition, this platform should allow commanders and their staff to visualize the opspace; to abstract, synthesize, and fuse threat information, situation status, and resource status; and to explore alternative courses of action through gaming and simulation.

Development of this future platform is critical. The platform should rely on an open architecture drawing from commercial off-the-shelf tools to contain cost. It should also provide a secure, wireless, yet flexible collaborative workspace that allows interactive distribution of common situational recognition both in the field and among command posts and operations centers at all echelons. The system should facilitate decision-making, planning and response rehearsal for the entire range of emerging threats. ■

D&D Issues and Initiatives

Contaminant Surveillance and Reporting Systems: In Need of Help

David M. Spicer, Emergency Management/Terrorism Response Coordinator, Missouri Department of Health

The Scope of the Problem

Detection and reporting systems for biowarfare agents are woefully out of date, following as they do a cumbersome system set up for communicable disease reporting. This antiquated system requires physicians or laboratories to submit paper forms to local health departments. Although it works to track overall trends of the major communicable diseases, the data are not available for analysis until at least several weeks after the occurrence of illness and definitive laboratory diagnosis is required to confirm the data accuracy.

The time delay and the requirement for laboratory confirmation in existing surveillance systems make them inadequate for the surveillance needed to detect a bioterrorism incident. Most biowarfare agents on CDC's threat list will cause death or major morbidity if not treated within the first 24 to 48 hours with medication or vaccination. If a major release of one of these agents occurred, a mass campaign would have to be organized immediately to provide prophylactic therapy to large numbers of people within a very narrow time frame. The only way to extend this window would be to detect the release early. Clearly, paper forms mailed in after receipt of a laboratory report are inadequate.

Besides inadequate speediness in the old reporting system, there are also information deficiencies. Because a biowar event might cause disease among animals or plants, information from veterinarians, agriculture, zoos, and departments of wildlife and conservation should be integrated. Because sickened humans will likely resort to pharmacies, emergency rooms, hotline phones, poison control centers, urgent care centers, and physicians' offices, these places should be monitored for data. Since an effective surveillance system cannot await laboratory confirmations, new definitions need to be created for "syndromic" surveillance. The parties that would need to be included in such a system have not heretofore viewed themselves a part of a public health surveillance system: relationships need to be established; legal authority agreed upon among different agencies and levels of government; computer systems need to be designed to both collect and analyze this information; and a mechanism needs to be established to feed this information to someone with the authority to act on it.

Current Efforts

A few cities have designed their own systems to address some of these problems. Also, the Department of Defense has implemented an excellent surveillance system that currently functions within portions of the military community. Some federal funding has been allocated to

study this problem among the civilian community. Also, an office within CDC has been designated for bioterrorism surveillance.

Call to Action

Nationally, we are far from a unified, effective system. This is a complex and very critical problem. It is essential that a high level of authority and priority be given in developing an effective contaminant surveillance and reporting system. ■

D&D Issues and Initiatives

Musings on the Future of Biological Detection

Brett A. Burdick, Director, Technological Hazards Division,
Virginia Department of Emergency Management

There is little disagreement in the First Responder community that the single greatest deficiency in our ability to detect and monitor potential weapons of mass destruction lies in the area of biological agents. The claims of some snake-oil salesmen notwithstanding, an effective method does not currently exist for civilian First Responders to determine, with any degree of certainty, the presence, type, and level of biological agents that we may encounter. The reasons for this are manifold, ranging from the difficulty in discriminating between types of aerosolized particles to the problems of false-positive and false-negative detection. There is always a trade-off between specificity and sensitivity with detectors. We expect great progress in the ability to detect biological agents over the next several years, but the simple fact is that there are limitations to what can be done on the street.

Evolving technologies range from attractive to very limiting. Detector tickets and wet chemistry methods are logical first choices for contact detectors, but, to work, these require us to put First Responders "in harm's way"—standoff methods are clearly preferable. Other techniques—such as "aerosol shape analysis systems," "continuous flow liminometers," and various fluorescence technologies—all exist on mobile platforms, but they have high power requirements and are not yet very portable. Detection of aerosol clouds at a distance by "lidar" may have some application off the battlefield. Others are out there, but do not yet provide the answer we want.

On the IAB we often speak of "end-states," the equipment and tactics that we believe the First Responder community ultimately needs to do its jobs safely, effectively, and efficiently at a WMD incident. All of our efforts are directed towards desirable end-states. For instance, are "intelligent fabrics"—those materials that allow air and moisture to pass through them while blocking chemical and biological agents—the way that the civilian First Responder community should go? Or should it go the way of the military, abandoning "barrier technology" in chemical protective clothing and adopting adsorptive materials? Or should it treat WMD like all other chemical hazards and stay with the technologies it knows best? The selection of end-states drives, to a certain extent, the identification of acceptable approaches that, in turn, constrain research and development activity. In a very real sense, musings on end-states shape and mold our future.

So it is with biological detection. What are the appropriate end-states for First Responder's field-deployable biodetectors?

Some of us on the IAB joke about Star Trek Tricorders as our pie-in-the-sky device for detecting and monitoring all materials, not just WMD. You may remember that the Tricorder was carried by Science Officers when they beamed down to another one of those many new worlds

investigated by Captain Kirk, Mr. Spock, and the crew of the Starship Enterprise. This device gave its operators near omniscience regarding the threats and opportunities facing the landing party week after week. No rational being, of course, believes that such a device exists, but could we develop something like it over time?

The benefits of the Tricorder are legion. It is lightweight, portable, and requires only a single operator. It has low power requirements relative to the source available. It is rugged enough to withstand the rigors of transportation and operation in hostile (wet, dusty, hot, cold) environments. It is fully automatic and selectable. It employs both "standoff" (detection at a distance) and "through the wall" (detection through or around intervening obstacles) technologies, and it is not based on "wet chemistry" technology. The number of Tricorders available to the crew suggests that it has a relatively low cost. We don't know much about its training requirements but I would assume that they are not overly time-intensive. And I don't recall a single episode where the Tricorder gave a false positive reading. All of these attributes are the sorts of things that would make a field deployable, hand-held biodetector attractive.

Alas, mere musings about end-states. Tricorders do not exist and probably will not in the near future, if ever. But the Tricorder provides a good model of what I think the First Responder community needs. If we use it as a model of the desirable end-state, who knows what good ideas will come out of research and development efforts?

Perhaps I have it wrong. Perhaps this is not the correct end-state towards which we should move. But I think that the civilian First Responder community would agree that most of the attributes of the Tricorder are what we want. Focusing efforts on standoff rather than contact detectors, avoiding wet chemistry where possible, low power requirements, portability, minimal training for effective operation— these are all preferred traits. Getting there will take vision and hard work. ■

Standards Coordination Issues and Initiatives

Why the InterAgency Board is Essential

A.D. Vickery, Deputy Chief, Special Operations, City of Seattle Fire Department

The ability of the United States to appropriately defend itself against terrorism, in addition to accidental and natural disasters, depends on how effectively public safety sectors can respond in a coordinated and standard manner. Training, equipment, and command protocols must be standardized if we are truly to operate as a local/state/federal team.

The IAB is focused specifically on equipment standardization. The equipment it recommends must meet governing regulations, pass rigid certification, be tested to reasonable standards, and be affordable. These are not easy tasks. In many cases equipment-testing standards are not yet in place. Hence the importance of the IAB, which is the only national forum where civilian, military, and industry users can exchange information critical to improving interoperability on the scale needed to effectively deal with major incidents involving multiple agencies and jurisdictions.

There are no "shortcuts" to ensuring the operational capability and interoperability of this equipment. It is up to the IAB to demand the highest standards so that when an event occurs, those wearing and using the equipment are protected. IAB technical experts include many end-users who are dedicated to proving the critical input on the quality, operability, and affordability of this essential equipment. We cannot compromise the safety of those we ask to use this equipment.

There is still much work to be done. Funding to conduct the critical testing is not in place. The process is not moving forward as fast as those of us who respond to emergencies would like—but it is moving forward with the safety and security of the First Responder as priority one. The IAB is critical in continuing to advocate for the First Responder's needs. ■

The Standardized Equipment List 2001

Preface

Today I would like to talk about another step forward in the Federal Government's efforts against terrorism. When a terrorist act strikes the streets or rural areas of America, the first few minutes are very critical. The first people on the scene are often local rescue squads, fire fighters and police. They are on the front lines. The situation is often chaotic and dangerous.

For many victims, what these First Responders do in those first few minutes can mean the difference between life and death. These First Responders do so much. And we have seen them in action. But they need to be supported by proper plans, training and equipment to do the job right. The Federal Government must be a full partner in this effort. And we need to make State and local governments a full partner in the planning effort, since they know what they need there at the front line.

The Honorable Janet Reno
Attorney General
United States Department of Justice

Thursday, October 16, 1998

The United States of America is the most prepared nation among nations to combat terrorism. Our country's ability to prepare for and respond to domestic weapons of mass destruction terrorism is unique and expansive. In reviewing our existing infrastructure to deal with these types of asymmetrical threats, we realize that our robust capability can be stronger. In past years, the front line has been overseas. Today, the front line is our front door. It is to this end that our nation masses its strengths, talents, and resources in a dedicated and unified effort to combat domestic weapons of mass destruction terrorism.

Introduction

Success in deterring, preventing, preparing for, and responding to a conventional or non-conventional weapon(s) of mass destruction (WMD) terrorist attack in the United States is based upon establishing and maintaining a robust crisis and consequence management infrastructure. This capability must be adequately trained, equipped, exercised, funded, and capable of conducting response, relief, and recovery operations as part of the interagency team.

Standardized Equipment List (SEL)

The SEL is provided as a guideline and its use is voluntary. First Responders are to review the SEL when developing and acquiring their WMD response equipment. The SEL promotes interoperability and standardization among the response community at the local, state, and federal levels by presenting this standard reference. Individual government agencies dictate quantities of the items to be selected to meet the needs of their operational areas.

Governing regulations, industry standards, and other ruling bodies apply. Equipment for First Responder use must be in accordance with the National Fire Protection Association (NFPA), Occupational Safety and Health Administration (OSHA), and the National Institute for Occupational Safety and Health (NIOSH). Equipment for use by the United States Department of Defense (DoD) forces is governed by DoD Instruction 6055.1.

The SEL will consist of several versions as the list matures and continues to be updated with newly fielded equipment. As a consolidated reference, government organizations can present suggested references, at any time, for consideration to be included in the next version or annual update.

Equipment Categories

The Standardized Equipment List is organized into categories of:

- Personal Protective Equipment
- Operational Equipment
- Explosive Device Mitigation and Remediation
- InterOperable Communications and Information Systems

- Detection
- Decontamination
- Medical

The IAB, its members, or their parent organizations do not assume liability for the performance of the equipment mentioned in the SEL.

1. Personal Protective Equipment

Equipment that is worn to protect the individual from hazardous materials and contamination. Levels of Protection vary and are divided into three categories based on the degree of protection afforded. The following constitutes equipment intended for use in CB threat environment.

Level A. Fully encapsulated, liquid and vapor protective ensemble selected when the highest level of skin, respiratory, and eye protection is required. The following constitutes Level A equipment for consideration:

010A-001	Fully Encapsulated Liquid and Vapor Protection Ensemble, reusable or disposable (tested and certified against CB threats)
010A-002	Fully Encapsulated Training Suits
010A-003	Testing Equipment for fully encapsulated suits
010A-004	Closed-Circuit Rebreather (minimum 2-hour supply, preferred), or open-circuit SCBA or, when appropriate, Air-Line System with 15-minute minimum escape SCBA
010A-005	Spare Cylinders/Bottles for rebreathers or SCBA and service/repair kits
010A-006	Chemical Resistant Gloves, including thermal, as appropriate to hazard
010A-007	Personal Cooling System; Vest or Full Suit with support equipment needed for maintaining body core temperature within acceptable limits
010A-008	Hardhat
010A-009	Chemical/Biological Protective Undergarment (fire resistant optional)
010A-010	Inner Gloves
010A-011	Approved Chemical Resistant Tape
010A-012	Chemical Resistant Boots, Steel or Fiberglass Toe and Shank
010A-013	Chemical Resistant Outer Booties
010A-014	Land Mobile, Two-Way In-Suit Communications (secure, hands-free, fully duplex, optional). See ICIS Section Specifications.
010A-015	Personnel Alert Safety System (PASS) - (location and physiological monitoring systems optional)
010A-016	Personnel Accountability System
010A-017	HAZMAT gear bag/box

Level B. Liquid splash resistant ensemble used with highest level of respiratory protection. The following constitute Level B equipment and should be considered for use:

010B-001	Liquid Splash Resistant Chemical Clothing, encapsulated or non-encapsulated
010B-002	Liquid Splash Resistant Hood
010B-003	Closed-Circuit Rebreather (minimum 2-hour supply, preferred), open-circuit SCBA, or when appropriate, Air-Line System with 15-minute minimum escape SCBA
010B-004	Spare Cylinders/Bottles for rebreathers or SCBA (NIOSH-approved) and service/repair kits
010B-005	Chemical Resistant Gloves, including thermal, as appropriate to hazard
010B-006	Personal Cooling System; Vest or Full Suit with support equipment needed for maintaining body core temperature within acceptable limits
010B-007	Hardhat
010B-008	Chemical/Biological Protective Undergarment (fire resistant optional)
010B-009	Inner Gloves
010B-010	Approved Chemical Resistant Tape
010B-011	Chemical Resistant Boots, Steel or Fiberglass Toe and Shank
010B-012	Chemical Resistant Outer Booties
010B-013	Land Mobile, Two-Way In-Suit Communications (secure, hands-free, fully duplex, optional). See ICIS Section Specifications.
010B-014	Personnel Alert Safety System (PASS) - (location and physiological monitoring systems optional)
010B-015	Personnel Accountability System
010B-016	HAZMAT Gear Bag/Box

Level C. Liquid Splash resistant ensemble, with same level of skin protection of Level B, used when the concentration(s) and type(s) of airborne substances(s) are known and the criteria for using air-purifying respirators are met. The following constitute Level C equipment and should be considered for use:

010C-001	Liquid Chemical Splash Resistant Clothing (permeable or non-permeable)
010C-002	Liquid Chemical Splash Resistant Hood (permeable or non-permeable)
010C-003	Tight-fitting, Full Facepiece, Negative Pressure Air Purifying Respirator with the appropriate cartridge(s) or canister(s) and P100 filter(s) for protection against toxic industrial chemicals, particulates, and military specific agents.
010C-004	Tight-fitting, Full Facepiece, Powered Air Purifying Respirator (PAPR) or PAPR with chemically resistant hood with appropriate cartridge(s) or canister(s) and high-efficiency filter(s) for protection against toxic industrial chemicals, particulates, and military specific agents.
010C-005	Equipment or System Batteries will include those that are rechargeable (e.g. NiCad) or non-rechargeable with extended shelf life (e.g. Lithium)

010C-006	Chemical Resistant Gloves, including thermal, as appropriate to hazard
010C-007	Personal Cooling System; Vest or Full Suit with support equipment
010C-008	Hardhat
010C-009	Inner Chemical/Biological Resistant Garment (fire resistant optional)
010C-010	Inner Gloves
010C-011	Chemical Resistant Tape
010C-012	Chemical Resistant Boots, Steel or Fiberglass Toe and Shank
010C-013	Chemical Resistant Outer Booties
010C-014	Land Mobile, Two-Way In-Suit Communications (secure, hands-free, fully duplex, optional) See ICIS Section Specifications.
010C-015	Extraction Gear
010C-016	HAZMAT Gear Bag/Box
010C-017	Personal Alert Safety System (PASS) - (location and physiological monitoring systems optional)
010C-018	Personnel Accountability System

Note: During WMD response operations, the Incident Commander determines the appropriate level of personal protective equipment. The United States Environmental Protection Agency (EPA) [Actually these levels are called out in 29 CFR 1910.120, Appendix B] has outlined four (4) levels of protection: A, B, C, and D. The EPA defined these levels of protection primarily for workers at hazardous waste site activities, where emergency conditions typically do not exist. These EPA defined levels of protection are commonly and often inappropriately utilized by the fire service and emergency response organizations. They are inadequate and do not correctly define the chemical protective ensemble with respect to its intended use based on the hazard.

For hazardous materials emergency response, the only acceptable types of chemical protective clothing include totally encapsulating and non-encapsulating ensembles offering specific levels of vapor and/or liquid hazard threat protection. The EPA descriptions apply to how an ensemble is designed, not its performance. On the other hand, the National Fire Protection Association (NFPA) has classified chemical protective suits by their performance in three (3) standards:

- *NFPA 1991 Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*
- *NFPA 1992 Standard on Liquid Splash-Protective Clothing for Hazardous Materials Emergencies*
- *NFPA 1994 Standard on Protective Ensembles for Chemical or Biological Terrorism Incidents* (New Standard with Proposed Release July 2001)

EPA levels of protection should be used only as the starting point for ensemble creation. However, each ensemble must be tailored to meet the specific situation in order to provide the most appropriate level of protection. Emergency response and public safety organizations should conduct a hazard assessment and threat analysis for their jurisdictions. Protective ensembles and respiratory protective equipment (those certified as meeting NFPA and NIOSH minimum performance standards)

should then be procured. Personnel entering Protective Postures must also undergo medical monitoring prior to and after entry.

2. Operational Equipment

Equipment and references needed to sustain operations and provide general support during WMD response operations.

References

A suggested library, not necessarily all-inclusive, consists of the most current editions of the following publications:

020R-001	Personal Protective Equipment Selection Guide
020R-002	CHRIS Manual
020R-003	North American Emergency Response Guidebook, 2000 edition, U.S. Department of Transportation
020R-004	Emergency Medical Response to Hazardous Materials, Delmar Publishing
020R-005	Terrorism Handbook for Operational Responders, Delmar Publishing
020R-006	Hazardous Materials Field Guide, Delmar Publishing
020R-007	Hazardous Materials Chemistry, Delmar Publishing
020R-008	Jane's Facility Security Handbook
020R-009	Guide for Industrial Chemicals, National Institute for Occupational Safety and Health
020R-010	Merck Index
020R-011	Emergency Action Guides, Association of American Railroads
020R-012	Emergency Handling of Hazardous Materials in Surface Transportation, Association of American Railroads
020R-013	Farm Chemicals Handbook, Meister Publishing
020R-014	First Responder's Guide to Agriculture Chemicals Accidents, Foden-Weddell
020R-015	NIOSH Pocket Guide to Chemical Hazards
020R-016	GATX Tank Car Manual, GATX
020R-017	Hawley's Condensed Chemical Dictionary, Sax & Lewis
020R-018	Handbook of Toxic and Hazardous Chemicals and Carcinogens, Sittig
020R-019	TLVs and BEI's Guidebook, ACGIH
020R-020	Quick Selection Guide to Chemical Protective Clothing, Forsberg
020R-021	Matheson Gas Data Book, Matheson
020R-022	Effects of Exposure to Toxic Gases; First Aid and Medical Treatment, Matheson
020R-023	Hazardous Material Injuries, Stutz
020R-024	Emergency Care for Hazardous Materials Exposure, Bronstein
020R-025	Clinical Toxicology of Commercial Products, Williams & Wilkens
020R-026	Joint Information Center (JIC) Manual
020R-027	Household Chemicals and Emergency First Aid, Foden-Weddell

020R-028 Gardner's Chemical Synonyms and Trade Names, Ash
020R-029 Gloves Plus (computer program) (or other PPE selection guide)
020R-030 Medical Management of Biological Casualties Handbook
020R-031 Medical Management of Chemical Casualties Handbook
020R-032 Medical Management of Radiological Casualties Handbook
020R-033 Jane's Chemical/Biological Handbook
020R-034 Tempest CB-FRG (Chem-Bio) First Responder Guidebook
020R-035 Tempest Chem-Bio Frequently Asked Questions (CB-FAQ)
020R-036 Tomes Plus
020R-037 Transport of Radiological Materials; Q&A About Incident Response, Berga, Byrd, et.al
020R-038 International Edition, Symbol Seeker, Hazard Identification Manual
020R-039 Management of Chemical Warfare Casualties, Sidell

Note: This list does not imply a product endorsement, rather a library reference. Latest available edition of listed reference sources shall take precedence over listed editions and may be in either book or electronic form.

Equipment

020E-001 Green Line/Red Line Battery activated marking system or appropriate substitute.
020E-002 Boundary Marking Tape: YELLOW-Caution/RED-Danger/ Incident specific (i.e., radiological, biological, chemical)
020E-003 Equipment or System Batteries will include those that are rechargeable (e.g., NiCad) or non-rechargeable with extended shelf life (e.g., Alkaline, dry cell, etc.)
020E-004 Restricted Access and Caution Warning Signs
020E-005 Trauma-type First Aid Kit
020E-006 Emergency Eye Wash
020E-007 Timer or Stopwatch
020E-008 Safety Harness with 150' dry line retrieval ropes 12.7mm.
020E-009 Locking Carabiners
020E-010 ABC Fire Extinguisher
020E-011 Class "D" Fire Extinguisher
020E-012 Hand Lights, explosive-proof
020E-013 Air Compressors suitable for refilling self-contained breathing apparatus (SCBA) or operating air-supplied respirators
020E-014 Generator
020E-015 Electric Cord Reels
020E-016 Copper Grounding Rods, ¾" x 6' (minimum length) with slide hammer
020E-017 Grounding Cables, point-type clamps on both ends, ⅛" stainless steel (uninsulated) 50' minimum
020E-018 Multi-Meter, electrical, intrinsically safe
020E-019 Mask Leak/Fit Tester
020E-020 Backless Stools
020E-021 Ground Resistance Tester
020E-022 Traffic Safety Vests

020E-023	Coveralls (Nomex or Tyvek optional)
020E-024	Explosive-proof Exhaust Fans
020E-025	Megaphone/Public Address System
020E-026	Rapid Deployment Hardwall or Softwall shelter systems (Command and Control, Triage, etc.)
020E-027	Environmental Control System for Shelter Systems
020E-028	Collective Protective Systems for Shelters
020E-029	Litter Decontamination Mass Casualty
020E-030	Field Cart
020E-031	Commercial Vehicles with Run-Flat tires: Vans, SUVs, and Trucks for personnel transportation and equipment movement
020E-032	Mobile WMD Command Center
020E-033	General Purpose Freezer/Refrigerator
020E-034	Helmet Mounted Lighting System
020E-035	Portable Area Illumination
020E-036	Water Trailers/Source (potable and non-potable)
020E-037	Heat Stress Monitor (ambient and personal)
020E-038	Hazardous Material Shipping Containers
020E-039	Vehicle and Equipment Maintenance Packages
020E-040	Housing, Subsistence and Sanitation (Field Support) for Response Forces
020E-041	Overpacks
020E-042	Miscellaneous Non-sparking Tool Kit, to include bung and spanner wrenches
020E-043	Chemical Leak Control Kits
020E-044	Portable Air Cylinder Carts
020E-045	Equipment Bags
020E-046	Modular Back Packs
020E-047	Duty Gear and Modular Load Bearing Systems/Operational Vests
020E-048	Handheld Illumination
020E-049	Medical/Casualty Bags, CDC Standard
020E-050	Optics: Thermal Imaging and/or Light Amplification
020E-051	Individual Sleeping Systems: Bags and Bivys
020E-052	Storage Containers
020E-053	Evidence Bags
020E-054	Lock Out/Tag Out Systems
020E-055	Binoculars
020E-056	Capture and Containment System
020E-057	Tactical Body Armor
020E-058	Operations Area Personnel Tracking and Accountability System
020E-059	Access Control and Badge System

3. Explosive Device Mitigation and Remediation

Developed by the National Bomb Squad Commanders' Advisory Board (NBSCAB) to supplement the SEL with equipment specific to the remediation of explosive devices possibly associated with a WMD incident. This list is not all-inclusive, but is intended to be a reference for Public Safety Bomb Squads to select the appropriate equipment for response to a WMD incident. Quantities and specific type items must be determined by the local agency.

Personal Protective Equipment

030P-001	Level A Equipment. See PPE/OE Section Specifications.
030P-002	Respiratory Protective Equipment with individual facepiece
030P-003	Additional cylinders for RPS
030P-004	Air Purifying Respirators (APR) with chem/bio filters
030P-005	Bomb Search Protective Ensemble for Chemical/Biological Response
030P-006	Chemical/Biological Undergarment for Bomb Search Protective Ensemble
030P-007	Cooling Garments to manage heat stress
030P-008	Ballistic Threat Body Armor
030P-009	Ballistic Threat Helmet
030P-010	Blast and Ballistic Threat Eye Protection
030P-011	Blast and Overpressure Threat Ear Protection
030P-012	Fire Resistant Gloves
030P-013	Level B Equipment. See PPE/OE Section Specifications.
030P-014	Level C Equipment. See PPE/OE Section Specifications.

Note: Protective ensembles explosive device remediation during a WMD incident must provide the bomb squad technician with blast, fragment, overpressure and thermal hazard protection, as well as chemical and biological vapor and liquid threat protection. Assembling a protective ensemble that offers the appropriate combination of WMD explosive device threat protection for bomb squad technicians is a complex challenge. The vapor and/or liquid threat protective ensembles should be configured using EPA protection level (A, B & C) and minimum performance standards required by NFPA and NIOSH Standards

Operational Equipment

0300-001	Dearmer/Disrupter
0300-002	Real Time X-Ray Unit
0300-003	Portable X-Ray Unit
0300-004	Extra Cassettes for X-Ray
0300-005	Extra X-Ray Intensifying Plates
0300-006	WMD Upgrades for TCV (Total Containment Vessel)
0300-007	Robot
0300-008	Robot Upgrades
0300-009	Fiber Optic Kit (inspection or viewing)
0300-010	Night Vision Glasses/Goggles
0300-011	Explosive-Proof Flashlight
0300-012	Non-Sparking Tool Kit
0300-013	Battery-Operated Tools
0300-014	Electric Hand Tools
0300-015	Pneumatic Tools

0300-016	Hand Tools
0300-017	First Aid Kit
0300-018	Multi-Tester
0300-019	Battery Tester
0300-020	Portable Generator
0300-021	Pipe Bomb-Disabling Tool
0300-022	End Cap Remover
0300-023	Drill Bits
0300-024	Remote Opening Tools
0300-025	Rigging and Rope Equipment
0300-026	Various Pulleys and Clamps
0300-027	Grappling and Treble Hooks
0300-028	Shovels, Rakes and Sifting Tools
0300-029	Metal Detector
0300-030	Portable Explosive Magazines
0300-031	Post Blast Investigation Equipment
0300-032	Adhesive Tape
0300-033	Mirrors
0300-034	Scalpels and Knives with Additional Blades
0300-035	Handsaws
0300-036	Electric Stethoscope, Stethoscope
0300-037	Non-conductive Probes
0300-038	Explosive Tools (including but not limited to boothanger, shape charges, MWB disrupters, etc.)
0300-039	References. See PPE/OE Section Specifications.

InterOperable Communications and Information Systems

030I-001	Hardwired Communications Link
030I-002	Multi-Channel Radios (Encrypted)
030I-003	Video Camera
030I-004	Video Tape Recorder
030I-005	Portable Tape Recorder
030I-006	Laptop Computers with Modem, CD-ROM
030I-007	Portable FAX
030I-008	Portable Flat Bed Scanner
030I-009	Digital Camera
030I-010	Bull Horn
030I-011	Portable Global Positioning System (GPS)

Detection

030D-001	Chemical Field Test Kits
030D-002	Chemical Agent Monitors
030D-003	Biological Field Test Kits
030D-004	Biological Agent Monitors
030D-005	Radiological Monitors
030D-006	Radiation pagers

Collective Protection

030C-001	Tents, standard or air inflatable for chem/bio protection

4. InterOperable Communications and Information Systems

Equipment and systems providing connectivity and electrical interoperability between local/interagency organizations to coordinate WMD response operations.

040C-001 Land-Mobile Radio (LMR)/2-way communications:

(A) Individual/portable:
- i. Digital and Analog capable
- ii. Support 25Khz and 12.5Khz channels
- iii. Supports conventional systems
- iv. Project 25 compatible

(B) Mobile:
- i. Digital and Analog capable
- ii. Support 25Khz and 12.5Khz channels
- iii. Supports conventional systems
- iv. Project 25 compatible

(C) Base:
- i. Digital and Analog capable
- ii. Support 25Khz and 12.5Khz channels
- iii. Supports conventional systems
- iv. Project 25 compatible

(D) Other:
- i. Repeaters:
  - a. Digital and Analog capable
  - b. Support 25Khz and 12.5Khz channels
  - c. Supports conventional systems
  - d. Project 25 compatible
  - e. Portable and/or Fixed
  - f. Able to pass encryption transparently
- ii. Bridging:
  - a. Hardwired or Software definable
  - b. Multi-mode/Multi-band
    Supports 4, or more, transmit/receive radio frequency (RF channels)
  - d. Scaleable
  - e. Telephone interface
- iii. Bi-directional amplifiers:
  - a. Application defined
- iv. High Frequency (HF):
  - a. Deployable Antenna Systems
  - b. Automatic Link Establishment (ALE)

040C-002 Telecommunications/low-speed data:

(A) Cellular phones:
- i. Analog and Digital compatible
- ii. Cellular Priority Access Service (CPAS) enabled

(B) Cellular modems:
- i. Cellular Digital Packet Data (CDPD) enabled

(C) Land line:
- i. Portable Private Branch Exchange (PBX)

(D) Paging

(E) Satellite phones and modems:
- i. INMARSAT – B
- ii. UHF

(F) Non–infrastructure based, local, Microwave data link applications

040C-003 Wireless Local Area Network (LAN)

(A) Local area wireless data (WAN)
- i. Must include user defined wireless security
- ii. Must be frequency hopping (FH) compatible
- iii. Compatible with networkable operating systems
- iv. >10MBPS data transmission speeds

(B) National
- i. Direct Broadcast Signal (DBS)
- ii. Asymmetrical Satellite Data Service

040C-004 Public Alert/Notification

040C-005 Position Locating

(A) Global Positioning Systems (GPS)
- i. Differential GPS (DGPS) compatible

(B) Precision Locating Tracking (PLT) – indoor capable

(C) Automatic Vehicle Locating (AVL) systems

040C-006 Wire Line communications/Hardwire

(A) Non-radiation shielded transmission line

040C-007 Computer-related equipment:

(A) Desktop:
- i. > Video Graphics Adapter (XVGA)
- ii. > 16-bit audio
- iii. > 32MB video memory
- iv. > 500Mhz processor
- v. DVD
- vi. NTSC I/O
- vii. CDR
- viii. > 56k modem
- ix. Network Interface Card (NIC)
- x. > 15GB hard drive
- xi. PC MCIA slot
- xii. >60 MEG of RAM

(B) Laptop:
- i. > Video Graphics Adapter (XVGA)
- ii. > 16-bit audio
- iii. > 32MB video memory
- iv. > 500Mhz processor
- v. DVD
- vi. CDR
- vii. > 56k modem
- viii. Network Interface Connection (NIC) card 10/+100 Fast Ethernet
- ix. > 15GB hard drive (removable)
- x. PC MCIA slot
- xi. >64 MEGS of RAM

(C) Networking components:
- i. > 5-port hub
- ii. Network router
- iii. Networkable printer

(D) Video Projector

(E) Miscellaneous Adapter Cables/Connectors

(F) Personal Data Assistant (PDA) with connectivity

(G) Software:
- i. Operating system software (IBM-compatible; WIN98-compatible, Macintosh OS 7.5 compatible)

ii. Office software suite (spread sheet, database, word processing and graphics presentation)
iii. E-mail
iv. Virus protection
v. Firewall software
vi. Network management software
vii. Internet Browser
viii. Encryption software
ix. Plume modeling software (fate and transport)/databases capable of real-time linkage to sensors and meteorological monitoring and detection
x. ICS command/plans & decision-support tools
xi. Operational space visualization tools
xii. GIS software
xiii. NCBC/commercial chemical/hazard software and response system

040C-008 Portable Generators

040C-009 Uninterruptible Power Supply (UPS)

040C-010 Power Conditioning System

040C-011 Power Cells:

(A) Chargers
i. Solar
ii. Universal compatibility

(B) Conditioners

(C) Batteries:
i. Lithium (Li-Ion)
ii. Nickel Cadmium (NiCad)
iii. Nickel Metal Hydride (NiMH)
iv. Alkaline
v. (clam shell)
vi. Intrinsically safe batteries

040C-012 Portable Meteorological Station

(A) Monitors: temperature, wind speed, wind direction and barometric pressure at a minimum

040C-013 Site Surveillance/Survey:

(A) Camera:
i. Infrared (IR)
a. Thermal
b. Forward Looking Infrared Radiation (FLIR)
c. Decontamination-able/Disposable
d. Intrinsically safe housing
ii. Light Amplification
a. Decontamination-able/Disposable
b. Intrinsically safe housing
iii. Still Camera
a. Decontamination-able/Disposable
b. Intrinsically safe housing
iv. Video Camera
a. Decontamination-able/Disposable
b. Intrinsically safe housing
v. Illumination Equipment (IR)
a. Decontamination-able/Disposable
b. Intrinsically safe housing

5. Detection

Equipment to sample, detect, identify, quantify, and monitor for WMD agents (Chemical, Biological, Radiological, and Explosive) and/or Toxic Industrial Chemical contamination throughout designated areas or at specific points, and those items to support detection activities.

Detection:	The instrument's ability to detect the presence of a hazard.
Identify:	The instrument's ability to identify the specific hazard.
Quantify:	The instrument's ability to quantify the amount of the specific hazard. Chemicals measured in PPM/PPB. Radiological measured in MREM.
Point detection:	The detector is used in the hazard.
Stand-off detection:	The detector is used outside the hazard area.

Note: The letters [D], [I], [Q] after each instrument or detection equipment type indicates the general capability in reference to the definitions above. The sub-bullets under detection equipment types are some but not all of the technologies that fall into that category.

The manufacturer's product specification sheets should be consulted for specific performance regarding detection of WMD agents and/or Toxic Industrial Chemicals.

Chemical

050C-001	M-8 Detection Paper for chemical agent (G, H, V) identification [D]
050C-002	M-9 Detection Paper (roll) for chemical agent (military grade) detection [D]
050C-003	M-256 Detection Kit for chemical agent (military grade: blister: CX/HD/L, blood: AC/CK and nerve: GB/VX) detection [D]
050C-004	M-256 Training Kit
050C-005	M-18 series, Chemical Agent Detector Kit for surface and vapor chemical agent analysis (military grade: GB, CG, HD, L and AC) [D, I]
050C-006	Chemical Classifying Kits for unknown liquids, solids and vapors [D, I, Q] (A) Pesticide Screening Kit (B) PCB Test Kits
050C-007	Point Chemical Agent Detector that alarms at or below IDLH in PPM/PPB [D, I, Q] (A) Photo-Ionization Detector (PID) (B) Flame Ionization Detector (FID) (C) Surface Acoustic Wave Detector (D) Gas Chromatograph/Mass Spectrometer (GC/MS) (E) Ion Mobility Spectrometry
050C-008	Stand-Off Chemical Detector [D, I]
050C-009	Non-intrusive Detector for WMD and TICs [D, I]
050C-010	Chemical Agent Water Test Kit, M272 (military) [D]
050C-011	Colormetric Tube/Chip Kit specific for TICs and WMD applications [D, I, Q]

050C-012 Multi-gas Meter with minimum of O2 and LEL [D, I, Q]

050C-013 Leak Detectors (soap solution, ammonium hydroxide, etc)
(A) Ultrasonic

050C-014 pH Paper/pH Meter [D, Q]

050C-015 Waste Water Classifier Kit [D]

050C-016 Oxidizing Paper [D]

Radiological

050R-001 Radiation detection equipment (electronic or other technology that detects alpha, beta, gamma, and high intensity gamma) [D, I, Q]

050R-002 Personal Dosimeter [D, Q]
(A) Badge
(B) Electronic

050R-003 Scintillation Fluid (radiological) pre-packaged [D]

Biological

050B-001 Point Detection Systems/Kits [D, I, Q]
(A) Immunoassay or other technology

050B-002 Laboratory Analysis [D, I, Q]
(A) ELISA System
(B) PCR

Support

050S-001 Squirt Bottle

050S-002 Distilled Water

050S-003 Ammonia for chlorine detection

050S-004 Heat Sensor, infrared

050S-005 Surface Thermometer

050S-006 Drum Thieves

050S-007 Grab Sampling Tubes

050S-008 Plastic or Brass Scoops and Trowels

050S-009 Sample Jars

050S-010 Glass or Plastic Pipettes with aspiration bulb

050S-011 Tweezers

050S-012 Containment Vessels

050S-013 Biological Sampling/evidence kits
(A) Automated perimeter sampling systems
(B) Batch
(C) Continuous
(D) Portable air sampler

050B-014 Chemical Sampling/evidence kits
(A) Liquid
(B) Solid
(C) Air/vapor

6. Decontamination

Equipment and material used to clean, remediate, remove or mitigate chemical, biological, or radiological contamination.

060D-001	Decontamination Shelter System for individual and mass application with environmental controls, water heating system, showers, lighting, and transportation
060D-002	Decon Litters/roller systems
060D-003	Extraction Litters, rollable
060D-004	Patient Isolation Bags
060D-005	Runoff Containment Bladder(s), decontamination shower waste collection with intrinsically-safe evacuation pumps
060D-006	Spill Containment Devices
060D-007	Decontamination Trailer, multi-water source, and Prime Mover
060D-008	Decontamination Applicator and available solutions for personnel
060D-009	Decontamination Applicator and available solutions for equipment
060D-010	Overpak Drums
060D-011	CW-hardened disposable Personal Property Bags
060D-012	Disposable Modesty Clothing with footwear, adult and child sizes
060D-013	Disposable Towels
060D-014	Disposable Space Blankets
060D-015	Non-transparent Cadaver Bags (CDC standard)
060D-016	Transportation and Shipping Containers for contaminated clothing and equipment
060D-017	Traffic Cones and Directional Signage in multiple languages or pictographs
060D-018	Brushes
060D-019	Sponges
060D-020	Garden Hose with nozzles
060D-021	Decon Corridor Ground Cover
060D-022	Containment Basins, vehicle and personnel-sized
060D-023	5-gallon Buckets
060D-024	Drumliners
060D-025	Casualty and Personal Property Tracking System
060D-026	Clothing Removal Devices (scissors, razor blades, etc)
060D-027	Hand-operated Diaphragm Pumps with hoses
060D-028	Pressurized Sprayers
060D-029	HEPA (High Efficiency Particulate Air) Vacuum for dry decontamination
060D-030	Backless Stools
060D-031	Folding Tables
060D-032	Boundary Marking System
060D-033	Personal Decontamination Packets or Kits
060D-034	Equipment Decontamination Kit

7. Medical

Materials, treatments, equipment, and items to treat contaminated emergency personnel and endangered casualties. This listing is only a recommendation and specific pharmaceutical selections should be coordinated and approved by the medical authority in the jurisdiction adopting their usage.

Pharmaceuticals

070P-001	Adenosine
070P-002	Albuterol Sulfate
070P-003	Albuterol
070P-004	Amyl Nitrite
070P-005	Atropine Sulfate
070P-006	Atrovent
070P-007	Bactrim
070P-008	Benzathine pencillin
070P-009	Ciprofloxacin
070P-010	Cyanide Antidote Kit
070P-011	Diazepam, 10mg vial for injection
070P-012	Digoxin
070P-013	Diphenhydramine
070P-014	Dopamine
070P-015	Doxycycline
070P-016	Epinephrine
070P-017	Fortaz (Ceftazidime)
070P-018	Fosphenytoin
070P-019	Glucagon
070P-020	Haloperidol
070P-021	Hydroxoocobalamine
070P-022	KI (Potassium Iodide)
070P-023	Lactated Ringers Solution
070P-024	Lasix (Furosemide)
070P-025	Lidocaine, 1%
070P-026	Magnesium Sulfate
070P-027	Mark 1 Auto-Injector
070P-028	Methylprednisolone
070P-029	Morphine Sulfate
070P-030	Narcan (Naloxone)
070P-031	Nifedipine
070P-032	Nitroglycerin, Sublingual Tabs
070P-033	Nitroglycerin, for injection
070P-034	Normal Saline Solution
070P-035	PCN/Benzathine
070P-036	Phenytoin
070P-037	Polysporin Ointment
070P-038	Potassium Chloride
070P-039	Potassium Iodide, tablet
070P-040	Pralidoxime Chloride – (2-PAM/Protopam)

070P-041	Procardia (Nifedipine)
070P-042	Rifampin, capsule
070P-043	Saline
070P-044	Silver Sulfadiazine Cream
070P-045	Sodium Bicarbonate
070P-046	Solu-Medrol (Methylpred)
070P-047	Streptomycin
070P-048	Tenormin (Atenolol)
070P-049	Tetracaine Opthalmic, uni-dose
070P-050	Theophylline
070P-051	Toradol (Ketorolac)
070P-052	Vanceril (Beclomethasone)

Medical Supplies

070M-001	Alcohol Prep Pads
070M-002	Bags, Biohazard
070M-003	Bandage, Elastic, assorted sizes
070M-004	Bandage, Triangular
070M-005	Bretylium Tosylate
070M-006	Brush, Betadine
070M-007	Betadine Applicators (Providone iodine)
070M-008	Biohazard Bag
070M-009	Bite Block
070M-010	Blood Pressure Set, infant, pediatric, adult
070M-011	Blood Pressure Set, leg, adult
070M-012	Calcium Chloride
070M-013	Charcoal, Activated
070M-014	Chest Tubes
070M-015	Gauze, 3"
070M-016	Gloves, Latex, assorted sizes
070M-017	Glove, Sterile, non-latex, assorted sizes
070M-018	Gowns, Isolation, Disposable
070M-019	Heimlick Valve for Chest Tube
070M-020	Heparin Flush Kits (Buff Caps)
070M-021	Heparin Lock Adapter
070M-022	Intravenous Administration Set
070M-023	Intravenous Administration Set, Minidrip
070M-024	Intravenous Catheter, assorted gauges
070M-025	Intravenous Extension Set
070M-026	Intravenous Pressure Infusion Bag, 1000 cc, Disposable
070M-027	Intravenous Set, Butterfly
070M-028	Laryngoscope Blade, assorted sizes – both Miller and Macintosh
070M-029	Laryngoscope Handle
070M-030	Nasal Cannula
070M-031	Nasogastric Tubes
070M-032	Nasopharyngeal Airway, assorted sizes
070M-033	Nebulizer, Hand Held
070M-034	Needle, assorted gauges

070M-035 Needle, lntraosseous
070M-036 Nubain, 10mg vial for Injection
070M-037 Obstetrical Kit
070M-038 Oropharyngeal Airway, assorted sizes
070M-039 Otoscope/Ophthalmoscope
070M-040 Oxygen "Y" Yoke
070M-041 Oxygen Cylinder, "E", "M"
070M-042 Oxygen Mask, Non-Rebreather, adult, pediatric
070M-043 Oxygen Regulator, "E", "M"
070M-044 Oxygen Tank Wrench
070M-045 Oxygen Tubing, High Press, 50" and 100", male/female connector
070M-046 Pack, Thomas
070M-047 Pulse Oximeter w/Soft Case
070M-048 Shears, Trauma/Medic
070M-049 Shield, Eye Irrigation Lens
070M-050 Splint, SAMM
070M-051 Sterile Water
070M-052 Stethoscope
070M-053 Suction Kit
070M-054 Suction Unit, Battery-Operated with Battery Charger and Batteries
070M-055 Surgical Mask with Eye Shield
070M-056 Suture Kit, 7" Needle Holder
070M-057 Suture Kit, Disposable
070M-058 Suture Kit, Laceration Tray
070M-059 Suture Kit, Wound
070M-060 Suture, assorted kinds and sizes
070M-061 Syringe, assorted sizes with and without needles
070M-062 Syringe, Tubex Injector Device
070M-063 Tape, Adhesive, assorted sizes
070M-064 Tape, Cloth, assorted sizes
070M-065 Telfa Adhesive Pad
070M-066 Tongue Depressor
070M-067 Tourniquet, Disposable
070M-068 Veniflow Manifold

Equipment

070E-001 Backboard, Disposable
070E-002 Bag Valve Mask, Adult and Pediatric Rescue (Disposable)
070E-003 Bag, Victim Possession, cases of 25/case
070E-004 Bags, Biohazard
070E-005 Bags, Body (Heavy-Duty)
070E-006 Battery Tester, 12 Volt
070E-007 Batteries, assorted sizes, "AAA", "C", "O" Cell
070E-008 Bedsheets, Disposable
070E-009 Biohazard Bag
070E-010 Blanket, Disposable Emergency
070E-011 Bleach, 5%

070E-012	Debridement Kits
070E-013	Defibrillator with 12-lead ECG adapter
070E-014	Defibrillator, AC Auxiliary Power Supply
070E-015	Defibrillator Battery Support System
070E-016	Defibrillator External Pediatric Paddle
070E-017	Defibrillator/Monitor/Pacemaker
070E-018	Dextrose, 50%, vial for injection
070E-019	Digital Thermometer
070E-020	Dressing, Adhesive, Sterile
070E-021	Dressing, Sterile, assorted sizes, 8" x 9", 4" x 4"
070E-022	Endotracheal Tube, adult and pediatric
070E-023	Endotracheal Tube Stylette, adult and pediatric
070E-024	Faceshield, Chemical
070E-025	Electrolyte Replacement Fluid
070E-026	Disposable Wipes
070E-027	Sheets, Disposable
070E-028	Towels, Cotton, Disposable

Summary

This Standardized Equipment List provides the First Responder a reference as to the type of equipment required to prepare for and respond to a WMD terrorist attack. As mentioned earlier, the First Responder must determine exact quantities and items to be selected. The use of the identified equipment can only be done safely after jurisdictions develop standardized operating procedures coupled with appropriate education and training.

Just as important as the items on the SEL is the process by which the SEL continues to be developed. The IAB process is an institutional mechanism designed to self-improve the SEL through a set repeating process that is connected from the local, through the state, to the federal-level.

The SEL is a national effort. This list provides the InterAgency response community with a choice of standardized equipment from which to select. It is the Board's approved list providing equipment standardization and promoting interoperability of equipment and capability.

The InterAgency Board Membership

Reflecting Pool

The pool occupies what was once N.W. 5th Street. Here a shallow depth of gently flowing water is intended to help soothe wounds, with calming sounds providing a peaceful setting for quiet thoughts. Visitors may see their own reflection, a face of someone changed forever.

COURTESY OF THE OKLAHOMA CITY NATIONAL MEMORIAL

The InterAgency Board Membership

IAB SubGroup Chairs

Medical

Porter T. Shellhammer
Battalion Chief, Sarasota County Fire Department

Chief Shellhammer has over 26 years experience in the fire-rescue services as a firefighter, paramedic, Company Officer, and Command Officer. He is also credentialed as a Type-2 Planning Section Chief in ICS.

Chief Shellhammer holds an Associate's degree in Fire Science and a Bachelor's Degree in (Executive) Management. He is a graduate of the Executive Fire Officer Program at the National Fire Academy and an adjunct instructor for the NFA. He was co-developer of the NFA's Emergency Medical Services: Special Operations course and the National Terrorism Preparedness Institute's Medical Strategies for Weapons of Mass Destruction course.

Chief Shellhammer has been involved with the InterAgency Board since its inception in 1998.

Personal Protective and Operational Equipment

Ronald D. Watson
Battalion Chief, County of Los Angeles Fire Department

Battalion Chief Ron Watson is a 17-year veteran of the County of Los Angeles Fire Department. During that time he has worked as a firefighter, paramedic, apparatus engineer, and captain. He has a background in field operations, special operations, hazardous materials, fire prevention, communications, and command and control.

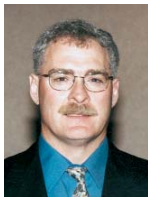
Chief Watson's present responsibilities include that of Terrorism Preparedness Coordinator for the County of Los Angeles Fire Department, focusing on training and equipping all Department members in preparation for incidents involving weapons of mass destruction.

Chief Watson holds a Bachelor's Degree in Fire Administration and Public Administration. He is a member of the Los Angeles County Terrorism Working Group (TWG) and the Los Angeles County Terrorism Early Warning (TEW) Group.

Jeff Marcus
Battalion Chief, Los Angeles Fire Department

Battalion Chief Marcus has over 26 years experience with the Los Angeles Fire Department. Chief Marcus is both a State Certified Hazardous Materials Technician and a State Certified Hazardous Materials Instructor. In addition, he is an instructor for the National Fire Association (NFA) Terrorist - Command Officers Program. Chief Marcus has been involved with the InterAgency Board since its inception in 1998. He is a member of the Los Angeles County Terrorism Working Group (TWG) and the Los Angeles County Terrorism Early Warning Group (TEW).

Federal Co-Chair



William E. Haskell III
U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

Bill Haskell has been a career professional with the Army Materiel Command for over 20 years. Mr. Haskell worked for 16 years as a Composite Materials Engineer at the Army Research Laboratory's Materials Technology Laboratory. He was the Program Manager for the Composite Infantry Fighting Vehicle Program and provided technical support to the United States Secret Service. Mr. Haskell now works at the U.S. Army Soldier and Biological Chemical Command's Natick Soldier Center on the Business Development & Management Team. He is also a voting member of the National Fire Protection Association's (NFPA) Fire and Emergency Services Protective Clothing and Equipment Technical Correlation Committee and the Hazardous Materials Protective Clothing and Equipment Technical Committee.

Mr. Haskell has a Master's Degree in Plastics and Textiles Engineering and a Bachelor's Degree in Civil Engineering. He is a member of the Army Acquisition Corps (ACC).

Science and Technology

Vincent J. Doherty
Captain, Hazmat Operations, City of New York Fire Department

Captain Doherty is the Commanding Officer of Hazardous Materials Company #1 and a 20-year veteran of the FDNY. He has 12 years experience in Hazmat 1 as a charter member, a Lieutenant, and Captain of the unit, and he is a member of NYC US&R TF-1.

Captain Doherty holds a Bachelor of Science Degree from St. John's University. He was a Research Chemist for Fisher Scientific prior to his fire service career. He is also a contract instructor for the National Fire Academy, CRA, and a subcontractor for RPI Corporation (Topoff 2000).

Federal Co-Chair

Hossam E. Ahmed
Systems Engineer, U.S. Department of Defense, Defense Threat Reduction Agency

Mr. Ahmed is a Systems Engineer in the Chemical and Biological Defense Directorate of the Defense Threat Reduction Agency, where he manages and oversees CBD programs related to combating terrorism. He has served in the Department of Defense in both military and civilian positions for more than 18 years. Mr. Ahmed has earned Bachelor Degrees in Biology, Mathematics, and Electrical Engineering, and a Master's Degree in Systems Engineering.

In addition to his civilian position, Mr. Ahmed serves as a Lieutenant Colonel with the Maryland Air National Guard. His military specialties are occupational safety and health, as well as nuclear, biological, and chemical defense.

InterOperable Communications and Information Systems

Eric E. Hahn
Commanding, Environmental Safety Group, Special Operations Division, City of Boston Police Department

Lieutenant Hahn has accrued over 31 years of law enforcement experience within the Boston Police Department. During his career he has held a variety of responsibilities including Lead Investigator for the Boston Environmental Strike Team, Harbor Master for the Port of Boston, Instructor for Domestic Preparedness Programs, and Police Liaison to the Boston Fire Department Hazmat Responses. For the last 13 years, Lieutenant Hahn has focused primarily on Emergency Management and Planning for Terrorist Incidents involving Weapons of Mass Destruction.

Lieutenant Hahn holds a Bachelor's Degree in Law Enforcement from Boston State College. In addition to participating in several Environmental Protection Agency training and management courses, he has completed numerous Federal Emergency Management Agency courses including Nuclear, Biological, and Chemical Incident Response and Hazardous Materials-Terrorism Awareness programs.

Detection and Decontamination

Gene Ryan
Chief Hazardous Materials, City of Chicago Fire Department

Chief Ryan is a 21-year veteran of the Chicago Fire Department with 14 years of Hazardous Materials experience. During that time, he has worked as a firefighter, apparatus engineer, Lieutenant, and Captain. He has a background of field operations, special operations, fire prevention, communications, and command and control.

Chief Ryan is a hazardous materials instructor for the University of Illinois, Illinois Fire Service Institute, and the National Fire Academy. Chief Ryan is a member of the Illinois Fire Service Instructors and the Illinois Department of Public Health Terrorism Task Force.

Steve Beaumont
Lieutenant, City of Seattle Fire Department

Lt. Beaumont is a 25-year veteran of the Seattle Fire Department. He joined the Hazardous Materials Team, a multi-response unit for fire, EMS, and hazmat, in 1982 and has served as a firefighter/technician and officer/specialist. In the mid-1980s and in conjunction

with the National Oceanic and Atmospheric Administration (NOAA), Lt. Beaumont was one of three hazmat technicians selected to develop the Computer Aided Management of Emergency Operations (CAMEO) for Hazmat. CAMEO is currently used throughout the United States and internationally. Lt. Beaumont continues to be involved with upgrades for current applications.

Lt. Beaumont serves as a Hazmat Specialist for the Washington Task Force Urban Search and Rescue Team and as the primary logistics contact for the City of Seattle's MMRS Team and Hazardous Materials Team. In addition, he also serves on the County EOC for equipment allocations, and as a co-chair of the Washington State Committee on Terrorism that provides direction on equipment and strategic plans to combat terrorism.

Robert J. Ingram
Battalion Chief, Special Operations, City of New York Fire Department

Chief Ingram is the Executive Manager of Special Operations for the City of New York Fire Department. He is a 19-year veteran of the Department, 12 of which involved hazardous materials response. He is a member of the National Fire Protection Association 472 Committee. He is an instructor of hazardous materials training for the International Association of Firefighters, Suffolk County, New York Fire Academy, and he is a NYS instructor for terrorism.

Wes Thomas
Battalion Chief, Downers Grove, Illinois Fire Department

Chief Thomas has over 30 years of fire service experience in urban and suburban fire departments, rural fire districts, and Department of Defense facilities. He currently serves with the Downers Grove Fire Department as a Battalion Chief in charge of special operations. Chief Thomas also serves with two volunteer fire departments when he is off duty from Downers Grove. He currently works as an adjunct instructor for a local community college, and has for the past 20 years, teaching programs in the fire science curriculum.

Chief Thomas holds an Associate Degree, two Bachelor's Degrees, and a Master's Degree. He is a graduate of the National Fire Academy Executive Fire Officer Program and holds numerous state certifications from the states of Illinois and Georgia.

Chief Thomas is a member of the Illinois Fire Chief's Association, the International Association of Fire Chiefs, the International Association of Fire Chief's Hazardous Materials Committee, the DuPage County Terrorism Task Force, the Illinois Department of Public Health Terrorism Task Force, and the Chemical Weapons Improved Response Program Decontamination Committee with the Department of Defense U.S. Army Soldier and Biological Chemical Command.

Federal Co-Chair
William E. Haskell III
U.S. Army Soldier and Biological Chemical Command, Natick Soldier Center, National Protection Center

Standards Coordination

Stephen N. Foley
Senior Fire Service Specialist, National Fire Protection Association (NFPA)

Mr. Foley is an Associate in the Institution of Fire Engineers (A.I.F.E.). He is currently a Senior Fire Service Specialist with the National Fire Protection Association (NFPA) and also acts as a Primary Investigator for the NFPA Response Team (NRT). He has over 26 years of experience in Fire Service with 12 years as a Fire Chief. In addition to serving as a Senior Instructor at the Massachusetts Fire Academy and Massachusetts State Police Academy, Mr. Foley has also served as an Adjunct Faculty member at the National Fire Academy, Fire Service College, United Kingdom, and at the O'Brien Institute, Dublin, Ireland.

Mr. Foley holds a Bachelor's Degree in Fire Science Administration and a Master's Degree in Management. He is a graduate of both the Executive Fire Officer Program at the National Fire Academy and the Senior Executive Program, Kennedy School of Government at Harvard University. Mr. Foley has authored Fire Service Books on Occupational Safety & Health, Incident Command Systems, and Emergency Service Organization and Deployment.

Federal Co-Chair

John M. Dower
Senior Project Officer, National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory

Mr. Dower is a Senior Project Officer in the National Personal Protective Technology Laboratory of the National Institute for Occupational Safety and Health, where he manages a joint NIOSH-NIST-SBCCOM project for the development of standards and certification processes for respiratory protective devices against toxic industrial chemicals, chemical warfare agents, biological warfare agents, and nuclear and radiological particulate. He has also held the positions of Chief of Fatality Circumstance and Epidemiology Program and of Research Industrial Hygienist during his 14 years at NIOSH. Mr. Dower was previously employed as an Industrial Hygienist and Mining Engineer with the Mine Safety and Health Administration for the 15 years preceding his employment at NIOSH, with specialized experience in mine fatality and disaster investigations, mine rescue and recovery, and health, ventilation, and ground control.

Mr. Dower is a Ph.D. candidate in Safety Engineering at Kennedy-Western University, and he holds Masters Degrees in Industrial Hygiene and Toxicology and in Safety Engineering. He has a Bachelor's degree in

Mining Engineering. Mr. Dower is a member of the Respirator Committee of the American Industrial Hygiene Association, the Terminology Committee of the International Society for Respiratory Protection, the American Conference of Governmental and Industrial Hygienists, and the American Society of Safety Engineers.

IAB Co-Chair

Supervisory Special Agent John N. Frank
Federal Bureau of Investigation, U.S. Department of Justice

Mr. Frank is a 15-year veteran of the FBI and has served in the Seattle and Dallas field offices. He received a Bachelor of Science degree in Mechanical Engineering from the University of Missouri at Rolla. His field experience includes the investigation of Violent Crimes, Organized Crime, Drug Matters, and White Collar Crime. Mr. Frank served as a member of the Dallas FBI Evidence Response Team, which supported several investigations, to include Waco, the Oklahoma City bombing, the Atlanta abortion clinic bombing, and the U.S. Embassy bombing in Tanzania. Mr. Frank is currently assigned to the Counterterrorism Division at FBI Headquarters, Washington, D.C., and is assigned to the Weapons of Mass Destruction Countermeasures Unit.

IAB Executive Board

Charles R. Bell
Program Manager, PM Marine/NBC, Marine Corps Systems Command

Mr. Bell, a retired Army Infantry Officer and one of the four founding members of the IAB, serves as the Chief, Defense Consequence Management Systems Office, Marine Corps Systems Command. His office is responsible for Research, Development, Test & Evaluation, Acquisition and Life Cycle Management of Consequence Management systems and equipment for over 200 DOD units assigned primary or secondary missions in support of local authorities in the event of a WMD incident.

Mr. Bell holds a Bachelor's Degree in Economics and a Masters Degree in Education from the University of Southern Mississippi. Mr. Bell is also a graduate of the New York City Fire Department Hazardous Materials Technician Course, the Northern Virginia Criminal Justice Academy Special Weapons and Tactics Course, and the Fundamentals of Systems Acquisition Management Course from the Defense Acquisition University.

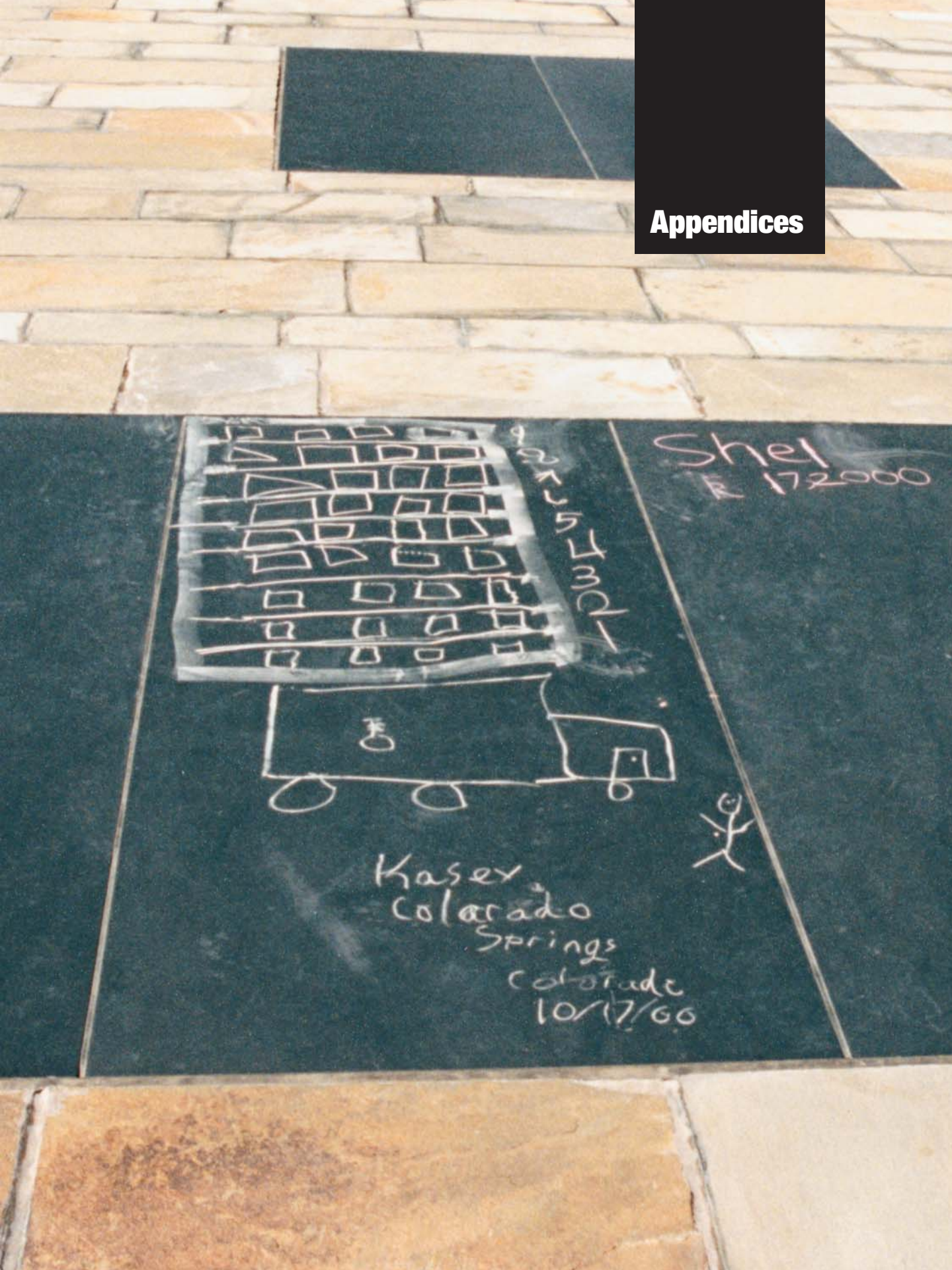
Thomas M. Antush
Senior Policy Officer, Federal Emergency Management Agency

Mr. Antush is the Senior Policy Officer for terrorism preparedness in the Office of the Director at FEMA Headquarters in Washington, DC. In this capacity, Mr. Antush works with FEMA Headquarters and Regional Offices, federal departments and agencies, and other organizations in developing the national strategy, policy, and guidance to support FEMA's domestic terrorism preparedness mission, goals, and activities.

Mr. Antush has been with FEMA since its inception in 1979, working largely in the areas of federal disaster response policy, planning and operations. In 1992, he coordinated the development of the all-hazard Federal Response Plan. In 1996, he coordinated the revision of the Federal Radiological Emergency Response Plan. He has been involved in several disaster response operations in the field in the areas of information management, planning, and outreach. He also has worked in the national security affairs program area, focusing on FEMA's roles and responsibilities in terrorism consequence management.

Mr. Antush graduated from the University of Washington in Seattle and attended Oxford University. He resides in Washington, DC. ■

Appendices



Children's Area

In the aftermath of the blast, countless expressions of encouragement were received from children. A wall of hand painted tiles sent to Oklahoma City in 1995 by children illustrates that caring. In addition, a series of chalkboards creates an oversized display of these works where children can continue to share their feelings - an important component of the healing process.

Courtesy of the Oklahoma City National Memorial

Appendix A

Matrix for Best Practices for Medical Management of WMD Events

IAB Medical SubGroup

The Medical SubGroup developed this matrix to capture the medical equipment and supply needs anticipated during patient treatment resulting from a WMD event. This tool, when used in conjunction with a local hazard/risk analysis study, is designed to help local medical communities prepare for multiple patient incidents that overwhelm the locality's capacity.

The horizontal headings are representative segments of the chronological progression of an incident. The first column of the matrix, beginning with Training, identifies the type of incident: Incendiary/Explosive, Radiological, Organophospate Chemicals, Blood Agent Chemicals, Blister Agent Chemicals, Biological – Toxins, and Biological – Infectious. The resulting intersections in the matrix will correspond to the following recommendations for needed equipment and supplies according to four basic categories: Respiratory, Pharmaceutical, EMS PPE, and Trauma. These are not listed in any priority ranking. Local medical authority must guide implementation of the suggested actions. Comment is also provided for considerations related to the local medical infrastructure.

As a general statement – cartridges, administration sets, dressings, bandages, fluids, and pharmaceuticals are consumable items. Local selection of items may include other disposable equipment.

	1 Pre-Incident	2 1st Field Response	3 Treatment & Decon	4 Transportation	5 Hospital	6 Recovery
A Training						
B Incendiary/Explosive						
C Radiological						
D Organophospate Chemicals						
E Blood Agent Chemicals						
F Blister Agent Chemicals						
G Biological – Toxins						
H Biological – Infectious						

General comments for consideration during evaluation of the local medical infrastructure:

1. Pre-Incident & Prophylaxis (A – H)

- Medical Infrastructure
  - Public health and epidemiology notification and participation in Unified Incident Command/Management process.
  - Assessment of intensive care unit (ICU) capabilities & availability (medical, surgical, and burn ICUs) with dynamic updates to the Unified Command to assist in the triage, transportation, and treatment of victims.
  - Public Information Officer as part of Unified Command.
  - Assessment of availability & acquisition of mechanical ventilators, CPAP and BiPAP.
  - Resource identification: HHS/OEP/NDMS, CDC, DoD/FBI,

NDPO, USAMRIID, REAC/TS, Poison Control & Information Center.
  - Medical intelligence from incident to receiving hospitals.
  - Hospital decontamination strategies.
  - Early dissemination of antidote application & toxicology information to all medical facilities potentially receiving victims once agent or toxidrome is identified.
  - Interfacility transfer strategies to move patients to more distant medical facilities or specialty centers.
- Trauma
  - Wound decontamination strategies.
  - Local trauma triage methodology may need to be slightly modified to assure high priority to respiratory and airway evaluation with selected appropriate interventions & antidotes.
- Respiratory
  - Provide maximum protection for unknown hazard.
  - More specific respiratory protection will be defined as specific hazard information is identified.
- Pharmaceuticals
  - Assess existing immediately available pharmaceutical resources (resources normally available).
  - Assess access to local pharmaceutical short term resupply & backup stocks (usual suppliers, local pharmaceutical suppliers not normally used in everyday operations, MOUs).
  - Strategy for local, regional, or national extended resupply (resource contact points – HHS/OEP/NDMS, MMRS, NMRT, CDC/NPSP, VA, REAC/TS, USAMRIID, DoD/FBI, MOUs with specific suppliers or open POs).
  - Access & application of pharmaceuticals not usually a part of local EMS scope of practice.
  - Oxygen and O_2 administration and distribution system extended resupply.
- EMS PPE
  - There is rapidly evolving knowledge and engineering for personal protective equipment.
  - Level A protection may be the only appropriate PPE for the unknown hazard; however, immediate rescue may be possible with SCBA and structural firefighting PPE for very short term exposure to mitigate immediate life threats.
  - Level C protection may be appropriate for health care providers operating in the Contamination Reduction Zone, Safe Refuge Area, or in a hospital setting. Other sections of the SEL identify specific components for each level.

2. 1st Field Response

- Airway
  - Bag valve mask
  - Large oxygen cylinder (H, K, etc.)
  - Manifold with multiple outlets
  - Stylettes (trach tube)
- Dressing
  - Triangular bandages
  - Burn sheets
  - Kling (2"/4")
- I.V. Fluids
  - Normal saline
  - I.V. drip sets
  - Tourniquets (I.V.)
- Miscellaneous
  - Cardiac electrodes
  - BP cuffs
  - Broselow pediatric tapes
  - Bio waste bags

Note: When applicable, sizes should be adult and pediatric for all items.

3. Treatment & Decontamination

A. Training

B. Incendiary, Explosive, & Firearms Trauma

- Infrastructure
  - Local trauma system, medical multi/mass casualty incident plan, trauma/burn interfacility transport plan.
- Trauma
  - Local triage methodology, operational multi/mass casualty incident plan.
- Respiratory
  - SCBA, particulate & asbestos APRs, specialized EOD respiratory protection.
- Pharmaceuticals
  - Tetanus antitoxin (Td), parenteral antibiotics, analgesics.
- EMS PPE
  - SCBA, structural firefighting or rescue protective equipment, subdued tactical body armor.

C. Radiological

- Infrastructure
  - Local NRC/DOE contacts, public health consultation for potassium iodide (KI) distribution, prepositioning of hospital health physicists/nuclear medicine resources to assist with hospital decon and radiation monitoring.

- Trauma
  - Wound decontamination & monitoring strategy, radiation monitoring for decon effectiveness.
- Respiratory
  - SCBA, HEPA PAPR, HEPA APR
- Pharmaceuticals
  - Potassium iodide
- EMS PPE
  - Personal dosimeters.

D. Organophosphates & Nerve Agents

- Infrastructure
  - Mechanical ventilator, CPAP, BiPAP, & ICU availabilities, hospital decon strategy, pharmaceutical & oxygen extended resupply strategy.
- Trauma
  - Wound irrigation strategy, respiratory & trauma triage methodology.
- Respiratory
  - SCBA, organic vapor/HEPA PAPR.
- Pharmaceuticals
  - Atropine, pralidoxime, ipratropium, albuterol, theophylline, diazepam.
- EMS PPE
  - Level C PPE

E. Blood & Choking Agents

- Infrastructure
  - Mechanical ventilator, CPAP, BiPAP & ICU availabilities, hospital decon strategy, pharmaceutical & oxygen extended resupply strategy.
- Trauma
  - Wound decontamination strategy, respiratory and trauma triage methodology.
- Respiratory
  - SCBA
- Pharmaceuticals
  - Amyl and sodium nitrite, sodium thiosulfate, methylene blue, dopamine, dobutamine, diuretics.
- EMS PPE
  - Level C PPE

F. Blister Agents

- Infrastructure
  - Burn ICU availability, burn interfacility transfer strategy, hospital decon strategy.
- Trauma
  - Wound decontamination strategy, respiratory & trauma triage methodology.

- Respiratory
  - SCBA, organic vapor/HEPA PAPR.
- Pharmaceuticals
  - Analgesics, parenteral antibiotics, tetanus antitoxin, access to dimercaprol.
- EMS PPE
  - Level C PPE

G. Biological-Toxins

- Infrastructure
  - Mechanical ventilator & ICU availabilities, public health department interface with CDC, hospital decon strategy.
- Trauma
  - Wound decontamination strategy.
- Respiratory
  - SCBA, HEPA PAPR.
- Pharmaceuticals
  - Trivalent botulinum antitoxin (CDC), pentavalent or heptavalent botulinum antitoxin (DoD/FBI).
- EMS PPE
  - Level C PPE

H. Biological-Infectious

- Infrastructure
  - Public health department interface with CDC (agent identification, antibiotic selection and distribution, assessment for prophylaxis), epidemiology as part of unified command, public information officer interface with public health officer, hospital decon strategy.
- Trauma
  - Wound decontamination strategy.
- Respiratory
  - SCBA, HEPA PAPR, HEPA APR, HEPA or N95 mask.
- Pharmaceuticals
  - Anthrax vaccine (DoD/FBI), vaccinia vaccine & vaccinia immune globulin (CDC), penicillin, doxycycline, ciprofloxacin.
- EMS PPE
  - Level C PPE

4. Transportation (A – H)

- Medical Infrastructure
  - Ambulances – stocked and staffed
  - Emergency evaluation/treatment beds and staff
  - Hospital (inpatient) beds and staff
  - ICU beds with monitoring capabilities and staff
- Trauma/Burn Capabilities
  - Medical infrastructure – EMS, ER, inpatient, OR, radiology, ICU, beds and staff

  - Burn sheets
  - Boards and collars
  - Burn dressings
  - Topical antibiotics, IV antibiotics
  - IV fluids
  - Oxygen
- Respiratory (for the patient)
  - Ventilators & respiratory technicians
    - Portable (field)
    - Hospital
  - Oxygen
    - Portable
    - Hospital
  - Airway adjuncts
    - Laryngoscopes, blades, batteries
    - Endotracheal tubes
  - Sedation, monitors, staffing
- Pharmaceuticals
  - Specific antidotes
  - Atropine, 2-PAM
  - Cyanide antidote kits
  - Methylene blue
  - Calcium gluconate
  - Supporting meds
  - Benzodiazepines
  - Routine medications required during hospitalization – Cardiac, Insulin, BP, etc
- EMS PPE
  - Level C
  - Rehab capabilities

5. and 6. Hospital & Recovery

A. Training

- MARK I Nerve Agent Antidote Trainers
- Litter – Chemical Agent Casualty/Decontaminable
- Detector Paper
- Training Aids, Skin & Equipment Decontamination
- Blue Book (Medical Management of Biological Casualties, 3rd edition or later)
- Green Book (Medical Management of Chemical Casualties)
- Medical Management of Radiological Casualties
- Yellow Book (EMS)
- REAC/TS Transport of Radiological Materials – Questions and Answers About Incident Response
- DoD Domestic Preparedness Hospital Provider Module with Medical Courses Video

B. Incendiary/Explosive

- Trauma
  - ADS (Automatic Defibrillating System)
  - Bandages with clotting chemical added (new)
- Respiratory
  - Ventilator, portable
  - Suction units
  - Pulse oximeter
  - Monitors (portable EKG, blood glucose, etc.)
  - Oxygen plus equipment (masks, tubing, regulators, etc.)
- Pharmaceuticals
  - Locally defined burn management and infection control items
- EMS PPE
  - Level C PPE with HEPA Filter Masks

D. Organophosphate Chemicals

- Trauma
  - Decontamination capability for skin
  - Locally defined resuscitation equipment
  - Suction devices
- Respiratory
  - Ventilators
- Pharmaceuticals
  - MARK I kits
  - Atropine
  - 2-PAM chloride (pralidoxime chloride)
  - Diazepam injector
  - Valium
  - Atropine sulfate ophthalmic ointment
  - Atropine sulfate injector
  - Pyridostigmine bromide tablets
- EMS PPE
  - Level C PPE

E. Blood Agent Chemicals

- Trauma
  - Oxygen and administration equipment
- Respiratory
- Pharmaceuticals
  - (Lilly) Cyanide Antidote Kit
  - Sodium nitrite
  - Sodium thiosulfate
- EMS PPE
  - Level C PPE with cyanide filter

F. Blister Agent Chemicals

- Trauma
  - Intubation equipment

- Respiratory
  - Bronchodilators
  - Ventilators
- Pharmaceuticals
  - Calamine
  - Silver sulfadiazine
  - Mafenide acetate
  - Sterile petroleum
  - Systemic analgesics
  - Cough suppressants
  - Dimercaprol (lewisite)
  - Betamethasone valerate cream
  - Sodium sulfacetamide, ophthalmic
  - Fluocinolone acetonide cream
  - Methylprednisolone sodium succinate
  - Neomycin & polymyxin B sulfate and dexamethasone ointment
- EMS PPE
  - Level C PPE
  - Decontamination available for skin & equipment
  - Portable showers

G. Biological-Toxins

- Trauma
  - Intubation equipment
  - Tracheostomy equipment
  - Superactivated charcoal (mycotoxin T2)
  - Fluid management equipment
- Respiratory
  - Ventilators
- Pharmaceuticals
  - Antitoxin (botulism)
- EMS PPE
  - Level C
  - Decontamination available for skin & equipment
  - Portable showers

H. Biological-Infectious

- Trauma – (same as EMS PPE)
  - Anesthesia device/equipment (tracheal tube, humidifier, nebulizers, airways, suction catheters, etc.)
  - Puncture resistant containers
  - Contaminated waste bags
  - Sterilizers/autoclaves
- Respiratory
  - Ventilators
  - Oxygen and related equipment
- Pharmaceuticals
  - Vaccines
  - Vaccinia immune globulin

  - Doxycycline
  - Ciprofloxacin
  - Tetracycline
  - Streptomycin
  - Ofloxacin
  - Gentamicin
  - Chloramphenicol
  - Tri-methoprim-sulfamethoxazole
- EMS PPE
  - Level C PPE with HEPA filter masks

Appendix B

Science and Technology Requirements Matrix 2001

IAB Science & Technology SubGroup

This matrix identifies future technology requirements for Detection, Individual Protection, Collective Protection, Medical Support, Decontamination, Communications Systems, Information Technology, and Operational Equipment.

Mission Area	Needs	Projects	S&T Source	Availability
Detection Team Leader: Mr. Chuck Swan, swanc@jpobd.osd.mil	**Chemical** • Reduced size and cost of sample collection devices • Minute sample collection capability • Non-intrusive agent detection • Broad spectrum agent detection • Personal dosimeters **Biological** • Reduced size and cost of sample collection devices • Minute sample collection capability • Non-intrusive Agent Detection • Broad spectrum agent detection • Personal dosimeters **Radiological** • Reduced size and cost of sample collection devices • Minute sample collection capability • Non-intrusive agent detection • Broad spectrum agent detection • Improved personal dosimeters **Explosives** • Non-intrusive, Remote Explosives Detection • Detection of unconventional explosives **Other** • Reduce power requirements and battery weight to improve system size/weight • Wearable, low-cost device to provide warning of exposure to chemical and biological agents	**Chemical** • Hand-held Broad Spectrum Chemical Agent Detector • Hand-Held Portable Chemical and Biological Agent Monitoring Systems with Low False Alarm Rates • Non-intrusive Agent Detection • Chemical Agent Detection Badges • Conductive Polymer and Metal Oxide Sensors for air and aqueous matrices • Advanced Non-Destructive Evaluation System • Miniaturized Portable Isotopic Neutron Spectrometer System • Chemical Agent Detection System for Colorimetric Analysis of Aqueous Samples • Air Sample Collection Device • Chemical Sensing Wipes to Detect Chemical Warfare Agents on Surfaces • Sample Screening for Chemical Warfare Agents via Small Photoionization Mass Spectrometry **Biological** • Biological Sample Collection Equipment, Aerosol, Environmental • Rapid Biological Threat Equipment for On-Site Detection • Broad Spectrum Biological Agent Detector • Rapid Biological Threat Analysis Techniques and Equipment for Sample Collection • Autonomous Pathogen Detector and Identifier • Tailored, Validated Assays for the User Community	• TSWG (Ms. Tracy Cronin, croninc@tswg.gov) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov) • DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil) • DoD (Mr. Chuck Swan, swanc@jpobd.osd.mil) • DoD (Mr. Chuck Swan, swanc@jpobd.osd.mil) • DoD (Mr. Chuck Swan, swanc@jpobd.osd.mil) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov) • DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov) • DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov)	• TBD • TBD • TBD • TBD • 4FY02 • 1FY02 • 2FY02 • 1FY02 • 4FY01 • 4FY02 • 4FY01 • TBD • TBD • TBD • TBD • TBD • TBD

Detection *continued*		• Near-Field Optical Biodetector	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 3FY02
		• Long Period Gratings - Based Optical Fiber Fluorescent Sensor	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 3FY02
		• Bacterial Endospore Detection using Room Temperature Ionic Liquids	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 3FY02
		• Primer Probe Validation, Reagent Lyophilization, and Improved Database	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 4FY02
		• Enhanced DNA Sample Extraction	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 4FY02
		• Expanded Polymerase Chain Reaction Assays	• DoD (Ms. Cathi Hoefler, cathi.hoefler@dtra.mil)	• 4FY02
		Radiological	• TBD	• TBD
		Explosives	• TBD	• TBD
		Other		
		• ChemLab/CB: Hand-Portable System for detecting a broad range of chemical agents and biotoxins	• DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov)	• TBD
		• CB Personal Alarm Monitor	• DOJ (Mr. Chris Tillery, tilleryc@ojp.usdoj.gov)	• 4FY02
Individual Protection Team Leader: Mr. Todd Brethauer brethauert@tswg.gov	• Multi-functional SCBA that may be used with bottled air, PAPR, or negative pressure systems, and that can provide a tailored respiratory protection capability from IDLH to lower concentrations. • Improved mask and filter design with increased respirator protection factors • Improved flexiblity of protective clothing • Decreased heat build-up of protective clothing • Skin protectants • Multi-Purpose canister/cartridge designs that offer appropriate levels of respiratory protection against toxic industrial chemicals, chemical warfare; terrorist threat agents, and airborne biological threat agents.	• Advanced Lightweight Chemical and Biological Protection	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY02
		• Joint Service Closure/Interface Concepts for Chemical/Biological Protective Clothing Ensembles	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY02
		• End-of-Service Life Indicator for NBC Mask Filters	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY04
		• Ion Implantation to Enhance Permselectivity of Polymers	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY05
		• Aerosol Threat Mediation	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY04
		• Immobilized Adsorbent Beds	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY03
		• Filtration of Toxic Industrial Chemicals	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY04
		• Advanced Adsorbents for Protection Applications	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY04

Mission Area	Needs	Projects	S&T Source	Availability
Individual Protection *continued*	• Lightweight, low-cost personal cooling systems that offer cooling capability for duration greater than two hours for use with hazardous materials PPE. • Lightweight, low-cost PPE tailored for law enforcement personnel. • Lightweight. low-cost PPE tailored for medical personnel operating in treatment facilities. • Next Generation Fire Fighter Bunker Gear (turnout coat, gloves, and boots) systems that offer appropriate protection against chemical agents. • Lightweight respiratory protection for escape/extrication purposes (for responders and victims) • Improved interface designs for mask, SCBAs, suits, boots, and gloves	• Novel Permselective Membranes • Reactive Nanofiber Membranes for CB Protective Clothing • Escape mask prototype evaluation and low profile escape mask.	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov)	• 4FY03 • 4FY04 • TBD
Collective Protection Team Leader: Mr. Hossam Ahmed hossam.ahmed@dtra.mil	• Absorptive and regenerative air filtration for public facility HVAC systems	• Advanced Adsorbents for Protection Applications • Aerosol Threat Mediation • Immobilized Adsorbent Beds • Filtration of Toxic Industrial Chemicals • Rapidly Established Collective Protection Facilities • Advanced Regenerative Filtration Maturation for Collective Protection Applications • Collective Protection Filter Residual Life Indicator • Low Cost and Lightweight CB Resistant Tentage • Mechanically Optimized Hermetic Seals	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil)	• 4FY04 • 4FY04 • 4FY04 • 4FY04 • 4FY03 • 4FY02 • 4FY03 • 4FY03 • 4FY03

Collective Protection *continued*		• Chemical and Biological Adsorption Filter Technology	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • TSWG (Ms. Tracy Cronin, croninc@tswg.gov)	• 4FY03
Medical Support Team Leader: Chief Porter Shellhammer pshellha@co.sarasota.fl.us	**Chemical** • Single Auto-injector Nerve Agent Antidote • Pre-exposure Topical Skin Protectant • Cyanide Pre-treatment • Appropriate experimental model systems for treatment efficacy and safety in humans. • Simple and sensitive field-portable diagnostic assays for chemical agent exposure. • Medical countermeasures to minimize lethality, morbidity, and incapacitation of chemical agents.	**Chemical**	• DoD (TBD)	• TBD
	Biological • Forward deployed, hand-held common diagnostic device. • Rapid virus identification technology. • Generic protection from families of toxins with subtle alterations in toxic modes of action. • Enhance the otherwise limited data on which to base rational drug and antibody therapies for bacterial, viral, and toxin agents of interest. • Establish and maintain capabilities to assess threats and provide countermeasures for new and emerging bacterial, viral, and toxin threats. • Vaccines for immunity against viral threat agents. • Antibodies and antiviral drugs for treatment of viral disease. • Multivalent vaccines and compatible vaccine platforms to protect against an array of unrelated viral agents. • Vaccines that produce long term protective immunity against toxin agents.	**Biological**	• DoD (TBD)	• TBD

Mission Area	Needs	Projects	S&T Source	Availability
Medical Support *continued*	• Prophylactic drugs to protect against toxin agents. • Therapeutics for treatment of diseases/symptoms caused by toxin agents			
	Radiological • Advanced medical treatment strategies for radiation injuries. • Improved techniques to detect and remove internally deposited sources of radioactivity • Drugs designed to increase resistance of responders to radiation and protect the responder against radiation injury without compromising performance. • Drugs designed to prevent the onset of radiation-induced performance decrements such as fatigue, nausea, and vomiting. • Biological dosimetry techniques for rapid injury assessment needed to guide medical treatment decisions and assessment of radiological health of response/combat units. • Extend stability of prophylactic drugs to allow their use in a slow-release delivery device for extended bioavailability and enhanced efficacy. • Drugs designed to protect personnel from the early and late effects of ionizing radiation without compromising performance • Improved drug delivery systems that provide non-encumbering protection during the entire period of radiation exposure. • Enhanced biodosimetry technique that can differentiate prior from recent exposures to radiation. • Suitable radiation sources to study the effects of chronic exposure at relevant doses. • Minimize toxicity of radioprotective drugs used over protracted periods of time. • Reduce toxicity of heavy metal chelating agents while maintaining their efficacy.	**Radiological**	• DoD (TBD)	• TBD

Medical Support *continued*	• Extend bioavailability of prophylactic drugs to achieve maximum long-term protection. • Potential cumulative toxicity of prophylactic drugs (antimutagenic and anticarcinogenic agents) when used for extended periods. • Sustained drug delivery system of radioprotectants.			
	Combination • Drugs designed to protect the responder against the effects of radiation in combination with trauma, burns, infection, or chemical exposure. • Chemical, biological, and radiological casualty management techniques to improve survival and minimize recovery time.	**Combination**	• DoD (TBD)	• TBD
Decontamination Team Leader: Capt. Gene Ryan gryan@hotmail.com	• Non-aqueous Decontamination Methods and Materials • Non-liquid Decontamination Methods and Materials • Decontamination of difficult to replace equipment • Mass Personnel Decontamination with High Victim Throughput, even in cold weather environments • Low Cost Contamination Containment Vessels	• Destructive Adsorption Using Reactive Sorbents • Enzyme and Catalyst Based Decontamination • Universal Decontaminant for VX, GD, and HD Using Food-grade, Environmentally Acceptable Materials (DECON GREEN) • Surfactant-based Decontamination Solution • Dimethyl Dioxirane Aqueous Decontaminant • Environmentally Friendly Sensitive Equipment Decontamination • DF-100 Aqueous Foam • L-Gel Decontamination System	• DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DoD (Dr. John Weimaster, jfweimas@sbccom.apgea.army.mil) • DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov) • DOE (LTC Mark Weitekamp, mark.weitekamp@hq.doe.gov)	• 2FY06 • 2FY06 • 2FY07 • 2FY03 • 2FY07 • 2FY07 • TBD • TBD
Communications Systems Team Leader: Mr. John Stedman stedmanj@ojp.usdoj.gov	• Improved, interoperable (multiple agencies) communications systems • Increased wireless data communications ability.	• Low-cost, Multi-frequency Communications System • Software-defined radios • Convergence of wireless and info technologies	• DOJ (Mr. Tom Coty, cotyt@ojp.usdoj.gov) • DOJ (Mr. Tom Coty, cotyt@ojp.usdoj.gov) • DOJ (Mr. Tom Coty, cotyt@ojp.usdoj.gov)	• 4FY01 • 4FY01 • 4FY01

Mission Area	Needs	Projects	S&T Source	Availability
Communications Systems *continued*	• Increased communications functionality with wireless intercom combined with push-to-talk/reach-back capability. • Hands-free, wireless, lightweight communications system (hearing and speech) for use with PPE.	• Improved data modems • Power Agile Transmitters	• DOJ (Mr. Tom Coty, cotyt@ojp.usdoj.gov) • DOJ (Mr. Tom Coty, cotyt@ojp.usdoj.gov)	• 4FY01 • 4FY01
Information Technology Team Leader: Capt. Vincent Doherty vjdty@aol.com	• User-friendly multimedia hazard assessment tools • Computer models for predicting casualties following combined exposure to low levels of ionizing radiation and biological warfare/chemical warfare agent aerosols. • Computer models for determining likely location of chemical, biological, or radiological dispersal device based on limited point detection data. • Computer tools for training WMD emergency responders.	• New Analysis Tools and Models for Protective Clothing • Respirator Encumbrance Modeling • Virtual Emergency Response Training System	• DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Mr. Tony Ramey, rameyra@ncsc.navy.mil) • DoD (Dr. Edward Nagel, nagele@wood.army.mil)	• 4FY02 • 4FY02 • TBD
Misc. Operational Equipment Team Leader: Mr. Brett Burdick bburdick.des@state.va.us	• Chemical protective coatings for equipment • Lightweight and wireless personnel monitoring/tracking system to continuously locate responders in various urban infrastructure (buildings, tunnels, etc.) • Super-efficient, Multi-fuel Power Generator • Cost-effective, lightweight, easily transportable container that can be used by state and local bomb squads to transport pipe bombs • Explosives disruption device that can scatter explosive material without detonation	• Protective Coating for Facilitating Decontamination • Improved Bomb Containment Device • Flying Plate Disrupters	• DoD (Mr. Chris Zech, zechce@navair.navy.mil) • DOJ (Mr. Chris Tillery, tilleryc@ojp.usdoj.gov) • DOJ (Mr. Chris Tillery, tilleryc@ojp.usdoj.gov)	• 4FY02 • 4FY02 • 4FY02

Note: This matrix has been cross-checked with the National Security Council WMD Preparedness Group's, Non-medical Interagency Working Group Chemical, Biological, and Radiological Combating Terrorism Research and Development Report, August 1999. It will be updated internally on a regular basis.

Appendix C

Detection Equipment Matrix

IAB Detection and Decontamination SubGroup

Guidelines for Development of Detection Equipment

Chemical	Detect	Identify	Quantify
M-8 Detection Paper for Chemical Agent (G, H, V) Identification [D]	■		
M-9 Detection Paper (Roll) for Chemical Agent (military grade) Detection [D]	■		
M-256 Detection Kit for Chemical Agent (military grade: blister: CX/HD/L, blood: AC/CK and nerve: GB/VX) Detection [D]	■		
M-256 Training Kit			
M-18 series, Chemical Agent Detector Kit for surface and vapor chemical agent analysis (military grade: GB, CG, HD, L, and AC) [D, I]	■	■	
Chemical Classifying Kits for unknown liquids, solids, and vapors [D, I, Q]	■	■	■
Pesticide Screening Kit			
PCB Test Kits			
Point Chemical Agent Detector that alarms at or below IDLH in PPMs [D, I, Q]	■	■	■
Photo-Ionization Detector (PID)			
Flame Ionization Detector (FID)			
Surface Acoustic Wave Detector			
Gas Chromatograph/Mass Spectrometer (GC/MS)			
Stand-Off Chemical Detector [D, I]	■	■	
Non-intrusive Detector for WMD and TICs [D, I]	■	■	
Chemical Agent Water Test Kit, M272 (military) [D]	■		
Colormetric Tube/Chip Kit specific for TICs and WMD applications [D, I, Q]	■	■	■
Multi-gas Meter with minimum of O_2 and LEL [D, I, Q]	■	■	■
Leak Detectors (soap solution, ammonium hydroxide, etc.)			
Ultrasonic			
pH Paper/pH Meter [D, Q]	■		■
Waste Water Classifier Kit [D]	■		
Oxidizing Paper [D]	■		
Radiological			
Radiation Detection Equipment (electronic or other technology that detects alpha, beta, gamma, and high intensity gamma) [D, I, Q]	■	■	■
Personal Dosimeter [D, Q]	■		■
Badge			
Electronic			
Scintillation Fluid (Radiological) pre-packaged [D]	■		
Biological			
Point Detection Systems/Kits [D, I, Q]	■	■	■
Immunoassay or other technology			
Laboratory Analysis [D, I, Q]	■	■	■
ELISA System			
PCR			

Executive Summary

A common suite of First Responder equipment standards is needed to establish minimum performance, commonality, and interoperability requirements for Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) equipment utilized by First Responders to acts of terrorism. Such standards, and the associated requirements and test protocols, serve multiple purposes including: 1) to establish baseline capabilities and limitations for currently available equipment, 2) to guide production and technological developments by manufacturers and designers, and 3) to guide equipment procurement decisions by public safety and health agencies. This document presents the strategy and process within the IAB Standards Coordination SubGroup (SCS) for identifying, adopting, modifying, and developing CBRNE equipment standards in the following prioritized order: respiratory protection, personal protective, communications, decontamination, detection, and medical equipment. It does not address the specifics of schedules, resources, or those standardization processes that are agency- and organization-specific. It is relevant to note that no such suite of CBRNE equipment standards exists today.

This CBRNE Equipment Standards process will be accomplished through two phases – a "Preparation Phase" and an "Implementation Phase." During the Preparation Phase, requirements for standards will be identified from First Responder functional and operational equipment requirements. Functional requirements are derived in equal measure from an assessment of the threat(s) with which First Responders will have to deal and the operational practices and procedures (i.e., how they do business) that they will bring to bear to deal with that threat. The Technical SubGroups of the InterAgency Board will take the lead for developing the functional and operational requirements for their commodity areas, in close collaboration with the user community. These equipment requirements will be compared to existing standards to determine if existing standards can be adopted into the CBRNE Equipment Standards Suite, if modifications are required, or if gaps exist requiring new standards need to be developed.

During the Implementation Phase, the recommendations of the Technical SubGroups will be coordinated with appropriate Standards Development Organizations (SDOs), the Standards-Related Organizations (SROs), and the Standards Enforcement Organizations (SEOs) to facilitate adoption, modification, and development of standards for incorporation into the CBRNE Equipment Standards Suite. Gaps in standards will be presented to sponsoring agencies and organizations for new standards development. A review process will be established to periodically validate the Suite and all incorporated standards. The SCS, formed from the Standards SubGroup of the InterAgency Board by expanded membership to include the chairs of the Technical SubGroups, will manage this process. The National Institute of Standards and Technology, Office of Law Enforcement Standards (NIST/OLES), as the executive agent for the SCS, will implement and administer the CBRN Equipment Standards Suite repository, to include promulgation where appropriate.

Appendix D

A Strategic Plan for Developing Chemical, Biological, Radiological, Nuclear, and Explosives Equipment Standards

IAB Standards Coordination SubGroup

Implementation of this suite of standards may be a time consuming process. In the interim, NIST/OLES, on behalf of the SCS, will publish and administer a First Responder equipment compendium and set of guides to assist First Responder agencies in making informed procurement decisions. These documents will catalogue existing CBRNE equipment and their characteristics and contain test data where found.

The Strategic Plan for Developing CBRNE Equipment Standards

1.0 Purpose

A common suite of CBRNE equipment standards is necessary to ensure compliance with minimum requirements for performance, commonality and interoperability of equipment utilized by First Responders in the public safety and health communities. Such standards, as well as the specifications and test protocols that evolve from them, are needed to guide the efforts of the manufactures and equipment developers; and to serve as a guide for informed procurement decisions by medical/public health and public safety agencies. This document describes the strategy and process that the CBRNE Equipment Standards Project will take to develop that common CBRNE Equipment Standards Suite. This document further serves as the action plan for the CBRNE Equipment Standards Project and identifies the tasks that must be undertaken, and the organizations responsible for undertaking them, that are necessary to implement a CBRNE Equipment Standards Suite. It does not address the specifics of schedules, resources, or those standardization processes that are agency-specific. Those remain to be developed within the context of this strategic plan.

Based upon findings of the IAB SCS, the prioritized order for developing or adopting standards will be: personal protective equipment, communications equipment, decontamination equipment, detectors, and medical equipment.

2.0 Goal and Objective

2.1 Goal of the CBRNE Equipment Standards Project – The goal of the CBRNE Equipment Standards Project is to enhance public safety and health by defining and promulgating a set of standards for CBRNE equipment that ensures minimum performance, quality, reliability and that are accepted by the medical and public safety communities. This suite of standards will be disseminated to the state, local, and federal public safety and health communities to facilitate informed equipment procurement and to guide manufacturers, developers, and the test-and-evaluation community to ensure product compliance.

2.2 Objective of the CBRNE Equipment Standards Project – The objective of the CBRNE Equipment Standards Project is to facilitate the adoption of standards that can be used by local, state, and federal public safety and medical agencies. In order to accomplish this, strong working relationships must be established with the public safety and medical/

public health user communities, to the point where the communities' representatives play a key and integral role in all facets of the standards process. Further, the project must be oriented, to the maximum extent possible, toward using the approaches, standards, specifications, etc., that already exist within standards development organizations (SDOs), standards-related organizations (SROs), and standards enforcement organizations (SEOs). This project will not reinvent work previously done or provide redundant products, but rather will take advantage of all available information and standards that may be applicable. This project will conform to the regulatory statutes and guidance governing the SDOs, SROs, and SEOs, as applicable.

3.0 Overview of the CBRNE Equipment Standards Suite Development Process

This section of the Strategic Plan details the approach to the standards suite development process. It is a description of how the organizations involved in the process propose that this development be carried out. This standards process can be seen as having two distinct phases — the "Preparation Phase" and the "Implementation Phase." During the preparation phase, functional requirements are defined and existing standards are surveyed to determine if they address these requirements. During the implementation phase, gaps in the existing standards will be addressed. Additionally, because the implementation of this suite of standards is necessarily a time-consuming process, some interim steps will need to be taken to provide manufacturers, developers and procurement officials guidance upon which they can act now.

3.1 Preparation – During the Preparation Phase requirements for standards will be identified by determining the First Responder functional equipment requirements and comparing those requirements against existing standards to see: (i) if existing standards can be adopted into the CBRNE Equipment Standards Suite; (ii) if they need to be modified before being adopted; or, (iii) if new standards need to be developed. Functional requirements are derived in equal measure from an assessment of the threat(s) with which First Responders will have to deal and the operational practices and procedures (i.e., how they do business) that they will bring to bear to deal with that threat. Users will be involved in every stage of this process, providing initial input and feedback on final products.

3.1.1 Identification of the Threat – The first step in the standards development process will be to do a threat assessment to identify the particular agents that are likely to be encountered in a domestic terrorism situation, the scenarios in which these agents are likely to be used by terrorists, and the likely methods of agent delivery in a civilian environment. Since the best information is likely to be held by national security organizations and will most likely be classified, it will, of necessity, be restricted to a limited number of people who have the proper security clearances. The second step of the threat assessment will then involve situations where simulated releases can be conducted, using

simulants, to develop the appropriate "models" and response methods, while working with trained public safety and medical teams.

3.1.2 Identification of Operational Requirements – This step involves collection of detailed information regarding the functional and operational requirements of CBRNE equipment based on user needs, practices and procedures, i.e., how they go about their business. While identification of the threat defines the nature of the agent(s) and the design parameters for a self-contained breathing apparatus, for example, practices and procedures will define the size and weight of that apparatus, how long it needs to function, and how, and if, it needs to be decontaminated. The information will be summarized and catalogued by equipment type.

3.1.3 Survey and Assessment of Existing Standards

3.1.3.1 A comprehensive survey of existing standards that are relevant to CBRNE equipment will be performed to identify if there are any that can be used without any modification, as well as those that can be used with some modification. The SCS will develop a review and approval procedure for both adoption and modification of existing standards. That procedure must take into account the agency-specific requirements and procedures of organizations currently involved in the development of standards.

3.1.3.2 In instances where the SCS review of existing standards has determined that a particular standard(s) not be adopted in whole or in part, it shall issue a report to the IAB, documenting the limitations and/or shortcomings of the existing standard(s).

3.1.3.3 Recommendations for adoption, modification and adoption, as well as the identification of new standards to be developed will be recorded for action during the implementation phase.

3.1.3.4 Implementation – During the implementation phase, recommendations resulting from the preparation phase will be carried out through coordination with appropriate SDOs, SROs, and SEOs to facilitate adoption, modification, and development of standards for incorporation into the CBRNE Equipment Standards Suite. A periodic review process to validate that the Suite and the standards incorporated into it will also be implemented.

3.2 Adoption of Existing Standards – Standards that require no modification will be added 'as is' to the CBRNE Equipment Standards Suite. The adoption and inclusion of a standard into the Suite will follow the review and approval process as developed by the SCS. Cognizant SDOs, SROs, and SEOs will be notified. These standards will be disseminated to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.

3.2.1 Modification of Existing Standards – If the SCS determines that an existing standard needs to be modified before it can be used, the review process and a discussion of the limitations shall be documented.

Modification to standards will be coordinated with the cognizant SDOs, SROs, and SEOs for implementation. An inability to convince SDOs, SROs, and SEOs to modify a standard will be dealt with through the issuance of voluntary standards. These standards will be disseminated to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.

3.2.2 Development of New Standards – This type of document will need the most time and resources to develop as well as the most extensive review process to ensure consensus. Where applicable, the need for new standards will be coordinated with the cognizant SDOs, SROs, and SEOs for development. If the appropriate SDOs, SROs, and/or SEOs cannot be convinced to modify a standard, or if no cognizant SDO/SRO/SEO can be found to develop a new standard, then the identified requirement will be addressed through the issuance of a voluntary standard(s). These standards will be disseminated to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.

3.2.3 Methodology for Reviewing Standards – A process will be put in place so that, on a biannual, periodic basis, the standards included in the CBRNE Equipment Standards Suite will be reviewed in light of evolving threats, evolving technologies, user practices, and user procedures to:

- Reaffirm still useful standards and disseminate that information to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.
- Recall obsolete standards once a review finds a document obsolete, and disseminate that information to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.
- Provide notification when any standards incorporated into the CBRNE Equipment Standards Suite are updated, modified, revised, replaced, or superceded by the SDO or SRO; and when exceptions or waivers are granted by SEOs.

3.3 Interim Steps – A First Responder equipment compendium and set of guides will be developed and published to assist First Responder agencies in making informed procurement decisions prior to the implementation of a CBRNE Equipment Standards Suite. These documents will catalogue existing CBRNE equipment and their characteristics and contain test data where found. Of necessity, interim voluntary standards and/or comparative evaluation protocols for testing of CBRNE equipment will also be developed and implemented for selected categories of equipment and threats.

4.0 Organization and Responsibilities

This section of the Strategic Plan describes the organization and management approach to the development of the CBRNE Equipment Standards Suite. The two key organizations in that process are the Technical SubGroups of the InterAgency Board and the SCS. The

Technical SubGroups will take the lead for developing the functional requirements for equipment in their commodity areas, in close collaboration with the user community, as well as for identification of standards for direct incorporation into the CBRNE Equipment Standards Suite, standards that could be incorporated with modification, and new standards that need to be developed. The SCS, which includes the chairs of the Technical SubGroups, will manage this process and will be principally responsible for implementation and management of the Suite.

Standards Coordination SubGroup – The SCS is responsible for coordinating CBRNE Equipment Standards projects of the IAB SubGroups with other organizations and enforcing authorities including, but not limited to, NIOSH, NFPA, OSHA, NDPO, DOE, FEMA, EPA, and NIST/OLES. As the various technical SubGroups of the IAB determine minimum design, performance, quality, reliability, and other qualification requirements for their respective areas, the SCS, representing regulatory, consensus, and voluntary standards organizations, will endeavor to create national harmonization by incorporating the requirements into their standards. The SCS will also serve as a reviewer during the development of qualification requirements by other SubGroups to:

- Alert SubGroups and request reconciliation when contradictory requirements for complementary equipment are proposed
- Alert SubGroups when proposed requirements are contradictory to federal or state regulations
- Raise attention to similar or additional qualification requirements under internal development within the regulatory, consensus, and voluntary standards organizations
- Provide technical and non-technical advice for improvements

Where there is an absence of standards for equipment deployed by emergency responders, the SubGroup members will serve as liaisons to their respective organizations to encourage development and harmonization of standards. The Office of Law Enforcement Standards at the National Institute of Standards and Technology (NIST/OLES), as the executive agent for the SCS, will implement and administer the CBRNE Equipment Standards Suite, to include promulgation.

SubGroups – Established by the IAB, these SubGroups are composed of subject matter experts that address domestic preparedness equipment, systems, and protection issues related to a specific commodity area. The list of IAB SubGroups includes the Medical, Personal Protective and Operational Equipment, Science and Technology, Detection and Decontamination, Standards Coordination, and Interoperable Communications and Information Systems SubGroups. Each SubGroup is chaired by a First Responder and consists of panels of subject matter experts specializing in their equipment commodity area of interest. The role of each SubGroup is to maintain and update its portion of the Standardized Equipment List and to address the ways and means by which technology can support WMD response concerns.

The Chair of each Technical SubGroup shall serve as a member of the Standards Coordination SubGroup.

Appendix E
Acronyms

ABS.....Advanced Bomb Suit
ACTE.....Advanced Concepts and Technology Exchange
AEMS.....Arizona Emergency Medical Systems
AHHA.....Arizona Hospital and Healthcare Association
ANSI.....American National Standards Institute
APCO.....Association of Public Safety Communications Officials
APR.....Air Purifying Respirators
ARNG.....Army National Guard
AVL.....Automatic Vehicle Location
BiPAP.....Bilevel Positive Airway Pressure
BW.....Biological Warfare
BWA.....Biological Warfare Agents
C^4ISR.....Command, Control, Communications, Computer, Intelligence, and Situational Recognition
CAD.....Computer Aided Dispatching
CB.....Chemical Biological
CB-FRG.....Chemical-Biological First Responder Guidebook
CBIRF.....Chemical Biological Incident Response Force
CBR.....Chemical, Biological, and Radiological
CBRN.....Chemical, Biological, Radiological, and Nuclear
CBRNE.....Chemical, Biological, Radiological, Nuclear, and Explosives
CBW.....Chemical Biological Warfare
CDC.....Centers for Disease Control and Prevention
CEOC.....County Emergency Operations Center
CMIS.....Consequence Management Interoperability Services
COA.....Course of Action
CoMPIO.....Consequence Management Program Integration Office
CORS.....Continuously Operating Reference Stations
CPAP.....Continuous Positive Airway Pressure
CST.....Civil Support Team
CW.....Chemical Warfare
CWA.....Chemical Warfare Agents
D&D.....Detection and Decontamination
DGPS.....Differential Global Positioning System
DHS.....Department of Health Services
DHHS.....Department of Health and Human Services
DNC.....Democratic National Convention
DoD.....Department of Defense
DOE.....Department of Energy
DOJ.....Department of Justice
DOMS.....Director of Military Support
DTAPS.....Disposable Toxic Agent Protective System

DTRA ..... Defense Threat Reduction Agency
ECBC ..... Edgewood Chemical Biological Center
EKG ..... Electrocardiogram
ELISA ..... Enzyme-Linked ImmunoSorbant Assay
EM ..... Electromagnetic Spectrum
EMS ..... Emergency Medical Services
EMT ..... Emergency Medical Technician
EOC ..... Emergency Operations Center
EOD ..... Explosive Ordinance Disposal
EPA ..... Environmental Protection Agency
ER ..... Emergency Room
FAR ..... Federal Acquisition Regulation
FBI ..... Federal Bureau of Investigation
FCC ..... Federal Communications Commission
FDA ..... Food and Drug Administration
FEMA ..... Federal Emergency Management Agency
FIS ..... Forensic Intelligence Support
FLEWUG ..... Federal Law Enforcement Wireless Users Group
FY ..... Fiscal Year
GC/MS ..... Gas Chromatograph/Mass Spectrometer
GIS ..... Geographic Information Systems
GM ..... Gas Masks
GPS ..... Global Positioning System
GWEN ..... Ground Wave Emergency Network
HAZMAT ..... Hazardous Materials
HEPA ..... High Efficiency Particulate Air
HPF ..... High Protection Factor
I&W ..... Indications and Warning
IA ..... Interagency Agreements
IAB ..... InterAgency Board
IAFC ..... International Association of Fire Chiefs
IAFF ..... International Association of Fire Fighters
IC ..... Incident Commander
ICIS ..... InterOperable Communications and Information Systems
ICS ..... Incident Command System
ICU ..... Intensive Care Unit
IDLH ..... Immediately Dangerous to Life and Health
IEC ..... Industrial Emergency Council
IPO ..... Intelligence Preparation for Operations
IRP ..... Improved Response Program
IV ..... Intravenous
IW ..... Information Warfare
JPO ..... Joint Program Office

JPO-BD.....Joint Program Office for Biological Defense
JSTPCBD .....Joint Service Technology Panel for Chemical and Biological Defense
LANL.....Los Alamos National Laboratory
LLNL .....Lawrence Livermore National Laboratory
MARCORPSYSCOM .....Marine Corps Systems Command
MCDRT.....Mass Casualty Decontamination Research Team
MCMD .....Multi-Casualty Mass Decontamination
MCMEO.....Maricopa County Medical Examiner's Office
MCPHD .....Maricopa County Public Health Department
MEMA .....Massachusetts Emergency Management Agency
MMRS .....Metropolitan Medical Response System
MMST .....Metropolitan Medical Strike Team
MOPP .....Mission Oriented Protective Posture
MOU.....Memorandum of Understanding
MSDS .....Material Safety Data Sheets
MSG .....Medical SubGroup
MSP.....Maryland State Police
NBC .....Nuclear, Biological, Chemical
NBSCAB .....National Bomb Squad Commanders' Advisory Board
NCEH.....National Center for Environmental Health
NDGPS .....Nationwide Differential Global Positioning System
NDMS .....National Disaster Medical System
NDPO .....National Domestic Preparedness Office
NFA.....National Fire Association
NFPA.....National Fire Protection Association
NGB.....National Guard Bureau
NIJ.....National Institute of Justice
NIOSH .....National Institute for Occupational Safety and Health
NIST.....National Institute of Standards and Technology
NMRT .....National Medical Respond Team
NOAA .....National Oceanic and Atmospheric Administration
NPR.....National Performance Review
NPSP.....National Pharmaceutical Stockpile Program
NRC .....Nuclear Regulatory Commission
NTIA .....National Telecommunications and Information Administration
OLES.....Office of Law Enforcement Standards
OPFOR .....Opposed by a Live Network Force
OPSEC .....Operational Security
OR .....Operating Room
OSHA .....Occupational Safety and Health Administration
OSINT.....Open Source Intelligence

PAPR.....Powered Air Purifying Respirator
PF.....Protection Factor
PFD.....Phoenix Fire Department
PHS.....Public Health Service
PM .....Program Manager
POC .....Point-of-Contact
PP&OE .....Personal Protective and Operational Equipment
PPE .....Personal Protective Equipment
PSWAC.....Public Safety Wireless Advisory Committee
PSWN .....Public Safety Wireless Network
PTC.....Positive Train Control
R&D .....Research & Development
RAID .....Rapid Assessment and Initial Detection
RAMS .....Responder Assets Management System
REAC/TS.....Radiation Emergency Assistance Center/Training Site
RFI .....Request for Information
RMS.....Resource Management Systems
ROE .....Rules of Engagement
S&T .....Science and Technology
SAR .....Supplied Air Respirator
SBCCOM .....Soldier and Biological Chemical Command
SCBA .....Self-Contained Breathing Apparatus
SCS.....Standards Coordination SubGroup
SDO .....Standards Development Organizations
SEL.....Standardized Equipment List
SEO.....Standards Enforcement Organizations
SPME .....Solid Phase Micro-Extraction
SRO.....Standards-Related Organizations
TCV.....Total Containment Vessel
TEW.....Terrorism Early Warning
TIC.....Toxic Industrial Chemicals
TIM .....Toxic Industrial Materials
TSWG .....Technical Support Working Group
TTP .....Tactics, Techniques & Procedures
TWG .....Terrorism Working Group
UCS.....Unified Command Structure
USAMRIID.....U.S. Army Medical Research Institute of Infectious Diseases
US&R .....Urban Search and Rescue
USCG .....United States Coast Guard
USMC.....United States Marine Corps
VA .....U.S. Department of Veterans Affairs
VoIP .....Voice over Internet Protocol
WMD .....Weapons of Mass Destruction