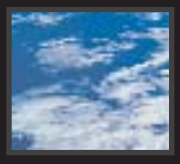
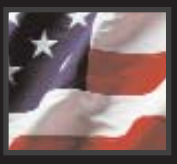
The InterAgency Board

2004 Annual Report
2005 Standardized Equipment List





Dedication

This document is humbly dedicated to those who have given their lives to ensure the safety of our great nation and to our nation's first responders, especially our dear friends and colleagues Charlie Bell and John Dower.

Saturday, August 21, 2004, the InterAgency Board lost one of its founding members and the responder community lost one of its biggest supporters. Charles "Charlie" Bell often gave people the impression that he was a grumpy old man, by growling, snorting, or staring at them while they talked; but, he had a shared vision to protect this country; and it was easy to detect his dedication to that end. Charlie could be very serious, but he also knew how to laugh and especially how to make others laugh. He often laughed at himself just to make someone else smile.

He was assigned at Marine Corps Systems Command as the Defense Consequence Management Systems Office, a little office with a big name and only Charlie could be an office unto himself. Charlie worked to provide equipment, technical support, and training to emergency responders-those who would respond to an incident involving weapons of mass destruction-a monumental task-one that takes thousands and thousands to execute and support. Charlie was one of those and he was a leader, long before 9/11.

Many of this country's greatest ideas and concepts originated with Charlie on a cocktail napkin in a smoke-filled room. Whether it was grumbling about politics or trying to solve interoperable communications issues for the nation's first responders, Charlie was always planning and thinking ahead.

During the 9/11 crisis, a lot of people weren't really sure what to do. Charlie knew exactly what to do and was eager to get into the action. He requested to report to the Office of Emergency Management of New York City about a week after 9/11 to assist with the logistical nightmare the attack had caused. During the drive to NY, Charlie saw the flags draped over overpasses and encouraging signs along the way, but when he saw the smoke trail that led to the void from across the river in NJ, he was angered, saddened, and at a loss for words---but determined.

Charlie spent more than a week going in and out of Ground Zero, sadly inspired by what surrounded him. At times, his friends, Eddie Beban and Hugo Herold, would see a fellow firefighter, yell something, embrace for just a moment, share a story about someone who was lost and, within moments, be laughing-the only medicine available to take away some of the pain. Perhaps this is where Charlie really began to embrace the camaraderie of the fire service-reminding him of his days of military service-that rare camaraderie that is so special for those who feel it and live it.

Charlie contributed his years of experience and provided advice on how to organize a small part of the logistics landscape. He was proud to be a part of it, proud to help in any way possible, proud to be able to take back lessons learned for future events that could occur any moment. There are many more little stories about Charlie; but they can be summarized by saying that, if everyone else's body is made up of 90% water, Charlie's was probably 90% personality, 5% Virginia gentleman, and 5% vinegar. He put that personality into everything he did and touched.

Charlie served the InterAgency Board until he passed away as Co-Chair of Interoperable Communications and Information Systems SubGroup.

In Memory of Charles "Charlie" R. Bell...

(1950 -2004)

Miners, workers, and responders everywhere lost a friend and champion for their safety on September 9, 2004, when John Dower passed away. The InterAgency Board lost a dear partner, one whose efforts to develop standards will not be forgotten.

John advocated worker safety as an employee, first at the U.S. Bureau of Mines; then the Mine Safety and Health Administration, Coal Mine Safety and Health District 3; and then for the National Institute of Occupational Health and Safety (NIOSH), in the Respirator Branch, Divisions of Safety Research and Respiratory Disease Studies. After a distinguished 30-year career, he retired from the NIOSH National Personal Protective Technology Laboratory in October 2003.

A supporter of mine safety and occupational health safety in general, he contributed to the development of standards to protect workers. For example, John developed standards for testing and evaluating coal mine dust personal sampling units and contributed to the development of mine ventilation standards.

In focusing on the most important worker issues, he led a team for the development of much-needed standards for chemical, biological, radiological, and nuclear self-contained breathing apparatus. Today, this equipment is recommended for use by firefighters and other emergency responders. To develop these standards, John established critical partnerships with the U.S. Army, the National Fire Protection Association, the National Institute for Standards and Testing, and numerous fire chief, firefighter and emergency responder organizations. John's personal efforts substantially contributed to the inception of the InterAgency Board for Equipment Standardization and InterOperability where he served as Co-Chair on the Standards Coordination Committee. The standards that he was influential in developing were completed and are recognized by the Department of Homeland Security for awarding homeland security grant monies. The National Fire Protection Association has incorporated the standards into their requirements. Today, most manufacturers have equipment for responding to terrorist attacks.

The standards that John toiled to develop have gained international attention through the International Society of Respiratory Protection. His unique approach integrated military and industrial technologies. Nowhere else in the world have these technologies been brought together to form standards to protect workers. The British Standards Institute has visited NIOSH regarding implementation of these standards.

John was a forward-thinking Industrial Hygienist dedicated to protecting worker safety and health. Workers have him to thank for the standards in place today to ensure their safety.

In Memory of John M. Dower...

(1951 -2004)

The IAB Member Organizations

Arlington County (VA) Fire Department

Austin-Travis County (TX) Emergency Medical Services

Boise (ID) Fire Department

Centers for Disease Control and Prevention

Chicago (IL) Fire Department

City of Las Vegas (NV), Office of Emergency Management

Civil Support Team

Contra Costa County (CA) Office of the Sheriff, Homeland Security Office

County of Los Angeles (CA), Fire Department

Dartmouth College

Department of Defense

Department of Veterans Affairs, Emergency Management Strategic Healthcare Group

Department of Veterans Affairs

Downers Grove (IL) Fire Department

Environmental Protection Agency

Fire Department, City of New York (NY)

George Washington University Medical Center

George Washington University, Response to Emergencies and Disasters Institute

Hennepin County (MN) Sheriff

International Association of Chiefs of Police

International Association of Fire Chiefs

International Association of Fire Fighters

Joint Program Executive Office for Chemical and Biological Defense

Lawrence (KS) Police Department

Los Angeles City (CA) Fire Department

Los Angeles County (CA) Sheriff's Department

Los Angeles County (CA) Fire Department

Louisiana State Police

Massachusetts Department of Fire Services

Medical College of Ohio

Miami Township (OH) Division of Fire and Emergency Medical Services

Nashua (NH) Fire Department

National Association of Emergency Medical Technicians

National Bomb Squad Commanders Advisory Board

National Emergency Management Association

National Fire Protection Association

National Institute for Occupational Safety and Health

National Institute of Standards and Technology

National Memorial Institute for the Prevention of Terrorism

National Personal Protective Technology Laboratory

Naval Research Laboratory

New Castle County (DE) Police Department Emergency Medical Services Division

Occupational Safety and Health Administration

Orange County (CA) Fire Authority

Orlando (FL) Fire Department

Phoenix (AZ) Fire Department

Placer County (CA) Health and Human Services

Research, Development and Engineering Command, Edgewood Chemical and Biological Center

Sacramento County (CA), Office of the Sheriff

Sarasota County (FL) Fire Department

Seattle (WA) Fire Department

Technical Support Working Group

Texas Forest Service

Texas Task Force 1, Urban Search and Rescue/Texas Engineering Extension Service

U.S. Army Center for Health Promotion and Preventive Medicine

U.S. Army Natick Soldier Center and National Protection Center

U.S. Capitol Police

U.S. Coast Guard, National Strike Force

U.S. Department of Health and Human Services

U.S. Department of Homeland Security

U.S. Fire Administration

U.S. Marine Corps, Chemical Biological Incident Response Force

U.S. Marine Corps, Systems Command

U.S. Marshals Service

U.S. Secret Service

U.S. Special Operations Command

United States Northern Command

University of Connecticut

University of Missouri Fire and Rescue Training Institute

Virginia Department of Emergency Management

Yale Emergency Medicine, Division of Emergency Medical Services

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The InterAgency Board (IAB) 2004 Annual Report and the 2005 Standardized Equipment List (SEL)

2004 IAB Chair

Alan Dennis "A.D." Vickery

Assistant Chief of Operations
Seattle Fire Department

A.D. Vickery is a 38-year veteran of the Seattle Fire Department. He is currently the Assistant Chief of Operations. This position deals with all aspects of the Fire Department, in regards to Fires, Hazardous Materials, Emergency Medical Services, Special Operations, and Homeland Security. Prior to his assignment as Assistant Chief of Operations, he was the Deputy Chief of Special Operations and was responsible for all operational issues for the Department's specialty teams; which included the Hazardous Materials Unit, the Marine Firefighting Unit, the Technical Rescue Unit, Emergency Preparedness, Metropolitan - Medical Strike Team, Urban Search and Rescue, and Homeland Security Planning. Assistant Chief Vickery has served in the Department as a Firefighter/Paramedic, the head of the Fire Investigation Unit, and on both Engine and Ladder Companies. He is recognized for his proactive role in preparing fire fighters to safely perform their jobs, using the latest technology available.

Letter from the Chair, A.D. Vickery

The IAB continues to advocate for standardization and interoperability in equipment, training, and response protocols.

2004 will be my final year as the Chair of the IAB. I'm moving aside to Co-Chair a new IAB Committee on Training which will begin its work in 2005. This Committee was formed at the direction of the membership to address the need to reinforce and provide end-user input into local, state, and national training for responder disciplines.

The recent directives on standardized Incident Command (NIMS) and response protocols (NRP) provide a strong foundation for standardized, performance based training programs.

The IAB will work with all Federal agencies and national standards making organizations to provide reasonable and appropriate guidelines for equipment, equipment use, and interoperability.

The IAB will continue to work with the National Memorial Institute for the Prevention of Terrorism (MIPT) and DHS/ODP to expand the web-based Responder Knowledge Base (RKB) to assist all disciplines in product comparisons, performance, and training requirements.

It has been an honor to serve our responders as the Chair of the IAB. I pledge the same commitment to work on appropriate and effective training to utilize the equipment we have been provided.

The Country is better prepared to prevent and respond to a terrorist incident or disaster as a result of Federal support. We still have a lot of work to attain and sustain a robust capability. Together we can.

Sincerely,

A.D. Vickery, Chair
InterAgency Board

The InterAgency Board Charter

The IAB is a user-working group supported by voluntary participation from various local, state, federal government, and private organizations.

Mission

The InterAgency Board (IAB) for Equipment Standardization and Inter Operability Working Group is designed to establish and coordinate local, state, and federal standardization, interoperability, and responder safety to prepare for, respond to, mitigate, and recover from any incident by identifying requirements for Chemical, Biological, and Radiological, Nuclear or Explosives (CBRNE) incident response equipment.

Scope

The IAB supports the local, state, and federal responders' efforts in Homeland Security by:

- Providing an independent operational viewpoint to federal agencies;
- Facilitating integration among local, state, and federal response communities to promote proper selection and use of the best available equipment and procedures to optimize safety, interoperability, and efficiency;
- Developing, maintaining, and updating a Standardized Equipment List (SEL) that provides the responder a reference to the type of equipment required to prepare for, respond to, mitigate, and recover from a CBRNE incident;
- Advocating for, assisting in, and promoting the development and implementation of performance criteria, standards, and test protocols for SEL-listed CBRNE incident response equipment;
- Encouraging the coordination of local and state response communities with established military and federal acquisition programs for procurement of SEL-listed CBRNE incident response equipment;
- Sharing knowledge, expertise, and technology regarding the detection, identification, warning, protection, decontamination, response management, and medical management of CBRNE incidents among local, state, and federal response communities;
- Providing a structured forum for the exchange of ideas among operational, technical, and support agencies for crisis and consequence management to promote interoperability among local, state, and federal response communities;
- Identifying and prioritizing CBRNE incident response equipment requirements;
- Encouraging manufacturers and governmental, military, and private agencies to sponsor priority research and development (R&D) projects to satisfy local, state, and federal CBRNE incident response equipment requirements;
- Providing assistance and/or guidance to agencies, associations, and manufacturers, requiring operational testing of new and emerging equipment and technologies; and
- Preparing and publishing an annual report to articulate the activities and accomplishments of the IAB;

Organizational Structure and Responsibilities

IAB Chairman-The IAB Chairman is selected from the ranks of the local and state membership. Confirmation shall occur by a simple majority vote of the general membership present at the meeting at which the annual report is finalized. The Chairman is elected to a two-year term starting with the January 2002 meeting.

- The Chairman administers, organizes, and facilitates the actions of the IAB.
- The Chairman provides recommendations to the Federal Coordinating Committee and direction to the SubGroup chairs.

Federal Coordinating Committee (FCC) - A coordination committee that provides the interface between the IAB, and sponsoring federal government agencies. The FCC consists of the federal officials from contributing agencies and departments. The FCC shall;

- Coordinate and leverage ongoing federal research, development, testing, and evaluation (RDT&E) efforts to meet the responder requirements as identified by the IAB;
- Solicit and coordinate mission support for the IAB, which includes activities such as organizational staff support, contributory funding, project sponsors, meetings, technical support, the IAB business cycle, and resulting products;
- Meet with the IAB Chairman on a regular basis to review SubGroup recommendations and actions;
- Meet to coordinate federal requirements for action by the IAB;
- Attend general membership meetings; and
- Review and approve the annual operating budget for the IAB, and maintain a support staff to facilitate the operation of the IAB.

SubGroups/Committees

- SubGroups - The IAB has four equipment SubGroups that consist of subject matter experts:
  - Personal Protective and Operational Equipment (PP&OE)
  - Interoperable Communications and Information Systems (ICIS).
  - Detection and Decontamination (D&D)
  - Medical
- Committees - The IAB has two additional committees that consist of subject matter experts and the Co-Chairs of the above four SubGroups:
  - Standards Coordination Committee (SCC)
  - Science and Technology (S&T)
- Co-Chairs - Each SubGroup/Committee elects two Co-Chairs, one from the local and state ranks and a second from federal or private ranks. The Co-Chairs shall be elected for two-year terms with the elections for the local/state Co-Chair and the federal/private Co-Chair being conducted on alternating years. The first local and state Co-Chair will have a term of one year to achieve this alternating cycle. Co-Chairs may be re-elected when their term has ended; there are no "term limits" for the Co-Chairs.

The duties of SubGroup/Committee Co-Chairs are as follows:

- Direct the efforts to accomplish the scope of IAB activities as identified in this charter.
- Provide liaison with the IAB Chairman.
- Provide meeting minutes, status of ongoing projects, and written reports of recommendations and requirements from the SubGroup/Committee annually or as required.
- Serve as a member on the SCC and S&T Committee.
- Provide membership recommendations. It is the responsibility of the Co-Chairs to review membership participation annually and to ensure SubGroup membership represents the interest across the entire responder community (fire, hazmat, law enforcement, emergency medical services, public health, etc.).

• Membership -

- Participate in the SubGroups/Committees and lend their expertise and support to the IAB Mission.
- SubGroup/Committee membership will be limited to 20 voting members.
- SubGroup membership may be augmented with additional subject matter experts, as non-voting members, for specific projects, or with members of other SubGroups in a non-voting status.
- Nomination for membership can be made by any IAB member to the SubGroup/Committee Co-Chairs.
- Members are appointed by a majority vote of the two SubGroup/Committee Co-Chairs and the IAB Chairman.
- Individuals may serve as voting members in only one SubGroup; however, they may participate in a non-voting status in other SubGroups.

Execution

The IAB shall conduct its mission during three formal board meetings annually and SubGroup/Committee sessions as needed.

- The first meeting shall consist of requirements development and briefing of R&D initiatives on CBRNE incident response equipment. These requirements will be included in the announcement for the Advanced Concept and Technology Exchange (ACTE).
- The second meeting shall consist of the ACTE to include industry participation.
- The third meeting updates the SEL and prioritizes requirements. These requirements are then forwarded to the FCC.

The InterAgency Board Structure

The IAB is organized into Committees and SubGroups that are chaired by a First Responder, supported by a Federal Co-Chair, and staffed with subject matter experts in that Committee's/SubGroup's area of interest. Each Committee/SubGroup is responsible for maintaining its subsection of the Standardized Equipment List (SEL). The Federal Coordinating Committee is the exception as it is chaired by a Federal Chair and composed of supporting federal government representatives.

The InterAgency Board (IAB)

The IAB Chair is selected from the ranks of the local and state membership. The Chair administers, organizes, and facilitates the actions of the IAB.

Chair
Alan "A.D." Vickery, Seattle (WA) Fire Department

Federal Coordinating Committee (FCC)

The FCC is a coordination committee that provides the interface between the IAB and sponsoring federal government agencies.

Chair
Pete Nacci, Department of Homeland Security (DHS), Office for Domestic Preparedness (ODP)

Standards Coordination Committee (SCC)

The SCC ensures that weapons of mass destruction (WMD) response equipment and technology is integrated in the existing standards boards and regulatory bodies.

Co-Chair
Bruce Teele, National Fire Protection Association (NFPA)

Federal Co-Chair
Kathleen Higgins, National Institute of Standards and Technology (NIST), Office of Law Enforcement Standards (OLES)

Science and Technology (S&T) Committee

The S&T Committee is focused on advanced concepts entering development and newly emerging technologies that might be applied to crisis and consequence management.

Co-Chair
Vincent Doherty, Fire Department, City of New York (FDNY)

Federal Co-Chair
Gabriel Ramos, Technical Support Working Group (TSWG)

Personal Protective and Operational Equipment (PP&OE) SubGroup

The PP&OE SubGroup addresses individual equipment, support systems, and area protection for WMD response.

Co-Chair
Douglas Wolfe, Sarasota County (FL) Fire Department

Federal Co-Chair
Philip Mattson, National Institute of Standards and Technology (NIST), Office of Law Enforcement Standards (OLES)

Interoperable Communications and Information Systems (ICIS) SubGroup

The ICIS SubGroup deals with communications, information management, technical information support, and public awareness issues.

Co-Chairs
John Sullivan, Los Angeles County (CA) Sheriff's Department (through October 2004)
Christopher Lombard, Seattle (WA) Fire Department (October 2004- Present)

Federal Co-Chairs
Charles Bell, U.S. Marine Corps System Command (Deceased: August 21, 2004)
William Snelson, United States Marshals Service (August 2004- Present)

Detection and Decontamination (D&D) SubGroup

The D&D SubGroup concentrates on intrusive and non-intrusive detection; monitoring, sampling, and analysis of suspected toxins; and methods to mitigate or dissipate a contamination.

Co-Chairs
Gene Ryan, City of Chicago (IL) Fire Department (through October 2004)
James Schwartz, Arlington County (VA) Fire Department (October 2004- Present)

Federal Co-Chair
Elaine Stewart-Craig, Research, Development and Engineering Command (RDECOM), Edgewood Chemical and Biological Center (ECBC)

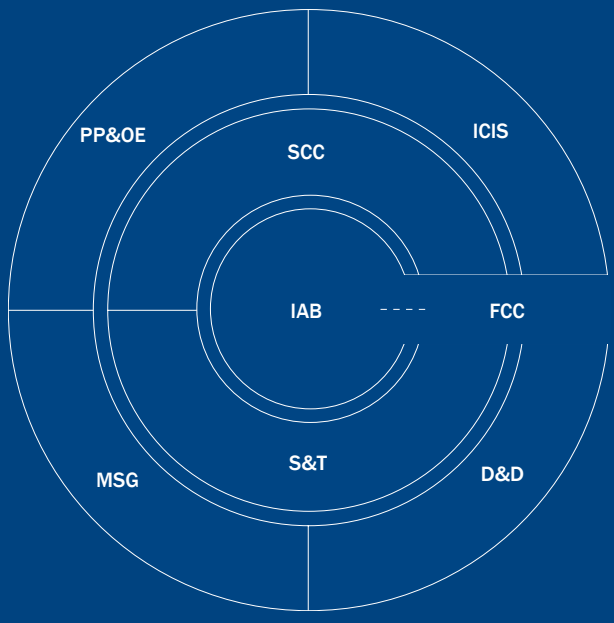
Medical SubGroup (MSG)

The MSG engages the issues of casualty treatment for victims of a conventional or non-conventional WMD attack and also preventive measures to avert victimization.

Co-Chair
Christian Callsen, Austin-Travis County (TX) Emergency Medical Services

Federal Co-Chair
Stephen Skowronski, Centers for Disease Control and Prevention (CDC)

Organization Chart



IAB
State & Local Chair

Federal Coordinating Committee (FCC)
Federal Chair

Standards Coodination Committee (SCC)
State & Local Chair
Federal Co-Chair

Science and Technology (S&T) Committee
State & Local Chair
Federal Co-Chair

Personal Protective and Operational Equipment (PP&OE) SubGroup
State & Local Chair
Federal Co-Chair

Interoperable Communications and Information Systems (ICIS) SubGroup
State & Local Chair
Federal Co-Chair

Detection and Decontamination (D&D) SubGroup
State & Local Chair
Federal Co-Chair

Medical (MSG) SubGroup
State & Local Chair
Federal Co-Chair

Mission

The Federal Coordinating Committee (FCC) provides the interface between the IAB Chair and the sponsoring federal government agencies. It coordinates the interests and initiatives of the federal community with the first responder community.

Membership

The FCC members include the U.S. Department of Defense (DoD); the U.S. Department of Homeland Security (DHS) which includes the Office for Domestic Preparedness (ODP), the Science & Technology Directorate, and the Federal Emergency Management Agency (FEMA); the National Institute for Occupational Safety and Health (NIOSH); and the National Institute of Standards & Technology, Office of Law Enforcement Standards (NIST/OLES). A brief description from each of the federal partners is listed below.

Department of Defense, Chemical/Biological Defense Program

The Assistant to the Secretary of Defense for Nuclear and Chemical and Biological (ATSD(NCB)) programs leads the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP). The Deputy Assistant to the Secretary of Defense (Chemical and Biological Defense) (DATSD(CBD)) assists him in the oversight of this program. The CBDP is a key part of a comprehensive national strategy to counter the threat of CB weapons as outlined in The National Strategy to Combat Weapons of Mass Destruction (WMD), December 2002.

CB defense capabilities must support the diverse requirements of military operations supporting national security as well as homeland security missions. The CBDP funds research to exploit leading edge technologies to ensure that U.S. forces are equipped with state-of-the-art capabilities to defend against CB threats through the far term.

Through the DoD Installation Protection Program, the CBDP has significantly strengthened its efforts for protecting its installations against chemical, biological, radiological, and nuclear (CBRN) threats. This

Federal Coordinating Committee (FCC)

Chair

Pete Nacci
Department of Homeland Security, Office for Domestic Preparedness

Membership

Paul Bergeron
Department of Defense, Office of the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense

Les Boord
National Institute for Occupational Safety and Health

Bert Coursey
Department of Homeland Security, Science and Technology Directorate

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

Gil Jamieson
Department of Homeland Security, Federal Emergency Management Agency

Peter Shebell, (Observer)
Department of Homeland Security, National Incident Management System Integration Center

program includes providing those emergency response personnel responsible for responding to CBRN events at an installation, with the equipment and training they need to protect them and respond to the event.

As one of the founding organizations of the IAB, the DoD continues to support all facets and areas of the IAB. DoD personnel serve on the FCC participating in the development the overall IAB strategy and hold memberships in all subgroups and committees in the IAB.

Department of Homeland Security, the NIMS Integration Center

The NIC is responsible for the further development, maintenance and modification of the National Incident Management System (NIMS) and the National Response Plan (NRP) in accordance with HSPD-5 and MD 9500, to ensure the NIMS and NRP provide for a uniform national approach to all incident management activities and the application of Federal resources to meet State identified priority needs. This is accomplished through close coordination with the White House Homeland Security Advisory Council, Federal Departments and Agencies, State Departments and Agencies, Tribal Governments and Local Governments and the Standards Developing Organizations and Agencies. The NIC participates on the IAB through the Science and Technology Directorate. The Science and Technology Directorate representative to the FCC serves as a liaison to the NIC.

Department of Homeland Security, Office for Domestic Preparedness

The Office for Domestic Preparedness (ODP) is the principal component of the Department of Homeland Security (DHS) responsible for preparing the United States to respond to acts of terrorism. ODP is part of the Office of State and Local Government Coordination and Preparedness (SLGCP) which is developing and implementing a national program to enhance the capacity of state and local agencies to respond to incidents of terrorism, particularly those involving chemical, biological, radiological, nuclear and explosive incidents, as well as natural disasters, through coordinated training, exercises, equipment acquisition, and technical assistance.

In carrying out its mission, ODP is responsible for providing training, funds for the purchase of equipment, support for the planning and execution of exercises, technical assistance and other support to assist states and local jurisdictions to prevent, respond to, and recover from acts of terrorism.

ODP achieves its mission by providing grants to states and local jurisdictions, providing hands-on training through a number of residential training facilities and in-service training at the local level, funding and working with state and local jurisdictions to plan and execute exercises, and providing technical assistance on-site to state and local jurisdictions.

Department of Homeland Security, Science and Technology Directorate

The Department of Homeland Security, Directorate of Science and Technology (S&T) serves as the primary research and development arm of Homeland Security, using the nation's scientific and technological resources to provide federal, state, and local officials with the technology and capabilities to protect the homeland. The focus is on catastrophic terrorism-threats to the security of our homeland that could result in large-scale loss of life and major economic impact. S&T's work is designed to counter those threats, both by evolutionary improvements to current technological capabilities and development of revolutionary, new technological capabilities. The Standards Portfolio Office, within S&T, is the organization through which DHS adopts standards, and it is important to note that the first standards adopted by DHS were those adopted by the IAB. The S&T Standards Office provides funds that support the standards development requirements identified by the IAB.

National Institute for Occupational Safety and Health

The National Institute for Occupational Safety and Health (NIOSH) established the National Personal Protective Technology Laboratory (NPPTL) in 2001 to provide world leadership for the prevention and reduction of occupational disease, injury, and death for workers who rely on personal protective technologies (PPT), including the nation's millions of miners, firefighters, and emergency responders, health care, agriculture, and industrial workers.

NPPTL brings together experts from many disciples dedicated to reducing the risk of job-related injury, illness, and death. Through targeted partnerships, research, service, and communication, NPPTL focuses on new and enhanced personal protective equipment for workers, including first responders during terrorist attacks or other disasters. NPPTL builds on NIOSH's longstanding testing and certification programs to test and approve respirators for use in traditional work settings, and to test and approve respirators for use by first responders against chemical, biological, radiological, and nuclear agents.

As one of the founding federal organizations on the IAB, NIOSH served as the first co-chair for the IAB Standards Coordination Committee and, with NIST/OLES, were the principle architects of the interagency agreement that serves as the foundation of the IAB standards development efforts. NIOSH develops and issues the chemical, biological, radiological, and nuclear respirator performance standards and conducts respirator certification of devices used by emergency responders. NPPTL staff support the Interagency Personal Protective and Operational Equipment (PP&OE) subgroup. In addition, NPPTL has membership on the National Fire Protection Association (NFPA) technical committees having responsibility for fire and emergency services protective clothing and equipment performance standards.

NPPTL applies state-of-the-art science to meet the increasingly complex occupational safety and health challenges of the 21st century. Our strategic research programs will ensure that the development of new personal protective equipment technologies keep pace with the changing needs and requirements of employers and workers.

National Institute of Standards and Technology, Office of Law Enforcement Standards

Since its founding in 1971, the primary mission of the Office of Law Enforcement Standards (OLES) at the National Institute of Standards and Technology (NIST) has been to develop minimum performance standards, reports, and guidelines for the public safety, security and criminal justice communities. Over the past 33 years, OLES has designed and managed standards development and research projects on behalf of agencies such as the National Institute of Justice (NIJ), the Department of Homeland Security (DHS), and others. Since 2000, OLES has served as the executive agent for implementing the standards

development strategy of the IAB. Additionally, OLES staff members serve as Federal co-chairs of the SCC and PP&OE SubGroup and hold memberships in both the D&D and ICIS SubGroups.

Role and Functions

The FCC provides the funding for operation of the IAB. Continued representation by multiple federal agencies allows the IAB to maintain its independence as an organization as well as to best use the resources and expertise of the federal community. Those agencies/departments that fund the IAB have voting rights on the FCC.

Upon unanimous agreement between the federal partners, ODP served as the FCC Chair of the IAB in 2004. The DoD representative will serve as the 2005 FCC Chair. The FCC Chair is elected on an annual basis. The DoD, DHS, and NIOSH will subsequently serve as FCC Chairs.

The FCC leverages ongoing federal research, development, testing, and evaluation (RDT&E) efforts to meet the responder requirements as identified by the IAB. The Chair of the IAB and the FCC work closely to prioritize initiatives within the IAB and the federal community. The FCC also coordinates ongoing IAB initiatives within the federal community to ensure task completion and to prevent duplication of efforts. This interagency relationship benefits both the IAB and the federal community by improving protection and response.

Highlights from 2004

- Increased the IAB Program Office support to the IAB in response to the increased workload, the demand for IAB SME participation, and the development of a new SubGroup.
- Continued coordination with National Memorial Institute for the Prevention of Terrorism (MIPT) to support Project Responder and the Responder Knowledge Base (www.rkb.mipt.org).
- Completed and updated the "new and improved" Standardized Equipment List (SEL) in both a print and electronic format. The 2005 SEL will appear in the 2004 Annual Report and on both the IAB and RKB websites in an electronic format.
- Recommended, supported and assisted in the facilitation of a new IAB SubGroup, a Training Sub-Group.
- Updated the IAB standards development priorities and requirements lists with the help of the SCC and S&T Committee.
- Provided multiple federal agency funding for the continued operation of the IAB.

The FCC continues to work with the SCC to address the IAB's list of priorities, particularly the development of CBRNE equipment standards, and to coordinate this development with other public and private standards development organizations, both within and outside of the federal government.

The FCC reviews and approves the annual operating budget for the IAB and maintains a support staff to facilitate operations. The FCC meets with the IAB Chair on a regular basis to review SubGroup recommendations and action items.

FCC Chair

Pete Nacci

Director, Systems Support Division
Department of Homeland Security,
Office for Domestic Preparedness

Pete W. Nacci is Director of the Systems Support Division of the Office for Domestic Preparedness in Washington, DC. He holds a concurrent appointment as a Professor in the Administration of Justice Department at George Mason University. He received his Bachelor's and Master's degrees from Bucknell University in Lewisburg, PA, and his Doctorate in Experimental Social Psychology from the State University of New York at Albany, NY. Before assuming his current position, he had an extensive career in the federal government, including positions as Staff Training Center Director and Director of the Office of Research for the Federal Prison System. He also held positions at the Office for National Drug Control Policy (ONDCP), the National Institute of Corrections, and the Senate's Permanent Subcommittee on Investigations. Pete spent 6 years at the National Institute of Justice (NIJ), where he was Co-Chair of the Joint Program Steering Group and he headed up NIJ's counterterrorism technology development programs. He has published extensively on human aggression, conflict resolution, management, terrorism, and technology. He has taught at major universities at the undergraduate and graduate level and, most recently, taught a course on the public safety response to terrorism at George Mason University. He has drafted legislation, helped craft the national drug policy for corrections for the ONDCP, and has published several book chapters.


"Out of Many, One"
Local, State, and Federal Standardization and Interoperability
IAB
THE INTERAGENCY

Mission

The mission of the SCC is to assist other SubGroups in identifying existing standards, facilitating standards development requirements, and to prioritize those requirements. The SCC assists in identifying minimum performance standards and compliance testing programs for the types of CBRNE equipment first responders' need most.

In preparing for possible CBRNE attacks, our nation's emergency response agencies must know more than simply what types of equipment to buy. They have to know which equipment they can trust with their lives and the lives of the citizens they serve. They also need assurance that various types of equipment intended to be used together (for example, CB protective clothing, air-purifying respirators, and radio headsets) are functionally compatible.

For more than 30 years, establishing minimum performance standards for critical equipment and subsequent testing of available models for compliance with those performance standards has proven the most successful way to give criminal justice and public safety practitioners the objective guidance they need for making informed buying decisions.

Membership

The SCC consists of representatives from federal and private standards development organizations and the SubGroup and Committee Co-Chairs. The NIST/OLES serves as the Committee's Executive Agent, charged with administering, maintaining, and promulgating the CBRNE equipment standards identified for development or adopted by the IAB.

Standards Coordination Committee (SCC)

Co-Chair

Bruce Teele
National Fire Protection Association

Federal Co-Chair

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

Membership

Les Boord
National Institute for Occupational Safety and Health

Christian Callsen
Austin-Travis County (TX) Emergency Medical Services

Vincent Doherty
Fire Department, City of New York (NY)

Robert Johns
Department of Homeland Security, Office for Domestic Preparedness

Jim Gass
National Memorial Institute for the Prevention of Terrorism

Stephan Graham
U.S. Army Center for Health Promotion and Preventive Medicine

Role and Functions

The SCC's role is to support and coordinate the efforts of the IAB SubGroups on standards development initiatives. Within that role, the SCC performs a number of functions, namely to:

- Review CBRNE equipment performance criteria developed by the SubGroups;
- Identify contradictions among criteria proposed for complementary equipment, as well as contradictions between proposed criteria and existing state and federal regulations;
- Facilitate the conciliation of contradictory criteria;
- Assist the SubGroups in identifying applicable existing standards and related standards development efforts by regulatory, consensus, and voluntary standards organizations;
- Coordinate the SubGroups' CBRNE equipment standards programs with those of other organizations and enforcing authorities, such as NIOSH, NFPA, Occupational Safety and Health Administration (OSHA), NIJ, Department of Energy (DOE), DHS, Environmental Protection Agency (EPA), American Society for Testing and materials (ASTM), American National Standards Institute (ANSI), and NIST/OLES;
- Support the development of new standards, when applicable;
- Provide advice on improving existing standards and standards development methods;
- Recommend new regulations and standards for unaddressed equipment;
- Promote harmonization of regulations, standards, and guidelines related to CBRNE emergency response equipment;
- Establish and periodically review priorities for the SubGroups' standards development and standards adoption efforts;
- Develop, maintain, and publish the list of IAB-adopted CBRNE protective equipment standards; and develop a schedule for reviewing and revising these standards;
- Research, publish, and regularly update CBRNE equipment guides and equipment care and maintenance guides to assist the emergency response community in selecting, using, and caring for CBRNE equipment; and
- Promote equipment interoperability by working in partnership with standards development organizations, trade associations, and manufacturers.

Christopher Lombard
Seattle (WA) Fire Department

Philip Mattson
National Institute of Standards and Technology, Office of Law Enforcement Standards

Gabriel Ramos
Technical Support Working Group

James Schwartz
Arlington County (VA) Fire Department

Stephen Skowronski
Centers for Disease Control and Prevention

William Snelson
United States Marshals Service

Elaine Stewart-Craig
U.S. Army Soldier and Biological Chemical Command, Edgewood Chemical and Biological Center

Douglas Wolfe
Sarasota County (FL) Fire Department

The SCC coordinates CBRNE equipment standards activities within the IAB and links those activities to both outside standards development efforts and the first responder community. The objective is to focus the nation's resources and expertise in a common effort that meets the real-world needs of the emergency response community- while also eliminating unnecessary duplication of effort; addressing critical gaps in standards research; and ensuring both harmony among CBRNE equipment standards and the effectiveness, safety, and interoperability of the equipment itself.

To ensure the highest levels of coordination and cooperation among agencies, the SCC has instituted numerous InterAgency Agreements (IAAs) and Memoranda of Understanding (MOUs) among federal, non-profit, and private standards agencies, including NIOSH, NIST, OSHA, DoD, NIJ, the U.S. Army's Edgewood Chemical Biological Center (ECBC), Development and Engineering Command (RDECOM) (formerly [SBCCOM]), EPA, DOE, ANSI, and NFPA. These IAAs and MOUs have proven invaluable in launching this nation's CBRNE equipment standards effort and achieving remarkable results in a very brief time.

Initiatives and Progress

Since the publication of the 2003 IAB Annual Report, the SCC has progressed on several fronts. Among the SCC's achievements and initiatives to date are the following:

- Continued efforts with NIOSH, along with RDECOM, and NIST are to develop appropriate standards and test procedures for all classes of respirators that will provide respiratory protection from CBRN agent inhalation hazards. A standards development effort for the development of a CBRN standard for Powered Air-Purifying Respirators (PAPR) is ongoing.
- Continued efforts within the IAB to align the SEL with the ODP Authorized Equipment List (AEL). Two versions of the SEL will be prepared per year, one in the spring with the annual report and the second offered only online with the AEL.
- Assisted in the coordination to establish dialogue between OSHA and NFPA to establish a crosswalk of existing levels of CBRN Protective Ensembles between the two agencies. Such developments will assist first responders in delineating the difference between equipment performance parameters set within NFPA Level A, B, and C and OSHA Levels I, II, and III.
- Revised the IAB list of standards development priorities.
- Continued to establish and strengthen ties with the DHS.
- Assisted in the initial coordination with the Detection and Decontamination SubGroup of the development of standards for both chemical and biological detection devices. Development of test metrics and subsequent standards are currently underway.
- Assisted in the coordination in expanding the IAB Charter to include training. A Training Committee was established to facilitate the integration of a training component into the existing IAB Infrastructure.
- Assisted in the adoption, development, and implementation of four ANSI Institute of Electrical and Electronics Engineering (IEEE) Radiation Detection Standards:
  - N42.35-Evaluation and Performance of Radiation Detection Portal Monitors for Use in Homeland Security 2003
  - N42.34-Performance Criteria for Handheld Instruments for the Detection and Identification of Radionuclides 2003
  - N42.33 - Radiation Detection Instrumentation for Homeland Security 2003
  - N42.32-Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security 2003.
- Initiated ODP's adoption of the requirement that grants for the purchase of CBRNE equipment be tied to equipment performance standards.
- Continued the integration of the SEL into the ODP-funded National Memorial Institute for the

Prevention of Terrorism (MIPT) Responder Knowledge Base (RKB)-an all-inclusive resource of information for the public safety community.

- Continued assistance in the integration of a five-volume series of NIJ Guides for the Selection of Equipment for Emergency Responders into the MIPT RKB. The five guides focus on:
  - Biological Detection Equipment
  - Chemical Detection Equipment
  - Chemical and Biological Decontamination Equipment
  - Communications Equipment
  - Personal Protective Equipment.
- Continued endorsement of free online access (through NFPA's Web page) to relevant NFPA standards regarding response, protective clothing and equipment, and CBRNE training.

Ongoing Partnerships

The core success of the SCC lies in its ongoing partnerships throughout the IAB and with outside organizations. These efforts will continue throughout the coming year and include the following:

- Serving as liaison to standards development organizations (SDOs) and other organizations regarding testing methods; certification requirements; and issues of equipment selection, use, and care.
- Working with the SubGroups to:
  - Develop recommendations to industry for increasing compatibility and interoperability of equipment in the SEL
  - Identify existing standards and specifications that relate to performance criteria for equipment in the SEL
  - Redefine and revise their standards development priorities to meet changing needs in the emergency response community.
- Focusing special effort on identifying existing performance standards and test methods that could be adopted or modified for top-priority equipment.

Priorities in Standards Development

The IAB Strategic Plan assigns the SCC responsibility for setting priorities among the SubGroups' standards programs, based on the needs of the emergency response and public safety communities.

At the time this report is being written, the priorities (in descending order) have been established as follows:

- Respiratory Equipment
- Detection Performance Standards and/or Performance Specifications
  - Chemical Vapor Detection
  - Biological
  - Radiological/Nuclear
  - Explosives
- Protective Clothing/Equipment
- Decontamination Agents, Solutions, Materials, and Equipment
- Interoperable Communications
- Medical Respiratory Ventilators

Considerable work on respiratory equipment standards has been completed. Performance standards for CBRN self-contained breathing apparatus (SCBAs), APRs, and escape hoods have already been developed; and compliance testing programs are in place for SCBAs and APRs. A draft hand-held chemical vapor detection standard was completed in fiscal year (FY) 2003. More information can be found in the individual SubGroup reports, elsewhere in this report.

The ranking of priorities continually shifts as standards are completed and new ones rise to the top. Changes in threats also affect the ranking. For example, authorities are increasingly concerned about the threat of explosives, and the growing urgency for reliable explosives detection devices in the field could easily push a standard for such devices well up the list.

Protective CBRNE Standards "Adopted" by the IAB

The SCC is responsible for publishing and continually updating the list of CBRNE protective equipment standards officially adopted by the IAB. As of the publication of this annual report, the list, organized by year of publication, is included in the following table.

Standard Title (** indicates newly adopted standard)	IAB Report Adopted
American National Standards Institute (ANSI) Standards	
ANSI N42.35 - Evaluation and Performance of Radiation Detection Portal Monitors for Use in Homeland Security **	2003
ANSI N42.34 - Performance Criteria for Handheld Instruments for the Detection and Identification of Radionuclides **	2003
ANSI N42.33 - Portable Radiation Detection Instrumentation for Homeland Security **	2003
ANSI N42.32 - Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security **	2003
NSF/ANSI 5-2000 Water Heater, Hot Water Support Boiler **	2004
ANSI Z89.1 - Protective Headwear for Industrial Workers	2003
ANSI/ISEA 105 - American National Standard for Hand Protection Selection Criteria	2003
ANSI/ISEA 107 - American National Standard for High-Visibility Safety Apparel	2003
National Fire Protection Association (NFPA) Standards	
NFPA 1936 - Standard on Powered Rescue Tool Systems (2005 edition)	2003
NFPA 1951 - Standard on Protective Ensemble for Urban Search and Rescue Operations (2001 Edition)	2002
NFPA 1971 - Standard on Protective Ensemble for Structural Fire Fighting (2000 edition)	2003
NFPA 1975 - Standard on Station/Work Uniforms for Fire and Emergency Services (2004 edition)	2003
NFPA 1976 - Standard on Protective Ensemble for Proximity Fire Fighting (2000 edition)	2003
NFPA 1981 - Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services (2002 Edition)	2002
NFPA 1982 - Standard on Personal Alert Safety Systems (PASS) (1998 edition)	2003
NFPA 1983 - Standard for Fire Service Life Safety Rope and System Components (2001 edition)	2003
NFPA 1991 - Standard on Vapor Protective Ensemble for Hazardous Materials Emergencies (2005 Edition)	2002
NFPA 1992 - Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies (2005 edition)	2003
NFPA 1994 - Standard on Protective Ensemble for Chemical/Biological Terrorism Incidents (2001 Edition)	2002
NFPA 1999 - Standard on Protective Clothing for Emergency Medical Operations (2003 Edition)	2002
NFPA 2112 - Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire (2001 edition)	2003

National Institute for Occupational Safety and Health (NIOSH) Standards	
NIOSH CBRN Standard for Open-Circuit Self-Contained Breathing Apparatus (December 2001)	2002
NIOSH Standard for CBRN Full Facepiece Air Purifying Respirator (APR) (April 2003)	2003
NIOSH Standard for CBRN Air-Purifying Escape Respirator and CBRN Self-Contained Escape Respirator (October 2003)	2003
Association of Analytical Chemist (AOAC)	
AOAC test methods for Bio Handheld Detectors **	2004
National Institute of Justice (NIJ) Standards	
NIJ Standard 101.04 - Ballistic Resistance of Personal Body Armor (September 2000 edition)	2003
Underwriters Laboratory (UL) Standards	
Underwriters Laboratory (UL) Gas and Vapor Detectors and Sensors ** (First Edition dated November 5, 2004)	2004
UL 913 - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations	2003

In addition to the standards adopted by the IAB, a number of other standards are included as "referenced" standards. These referenced standards are included because they may have partial applicability to some aspects of equipment in the SEL, may be of general interest, or in some cases are part of the Code of Federal Regulations. A comprehensive list of the adopted and referenced standards is included at the end of the SEL.

Near the end of calendar year 2003, the Department of Homeland Security Office for Domestic Preparedness (ODP) incorporated the standards previously adopted by the IAB into their grants programs, directing that federal grants for state and local agency purchase of CBRN equipment be tied to equipment performance standards. Additionally, the Department of Homeland Security Science and Technology Directorate, in February 2004, formally adopted the NIOSH and NFPA standards previously adopted by the IAB. The SCC is especially proud of these efforts.

Future Initiatives

The process of developing a minimum equipment performance standard often takes a number of years. This is especially true when, as in the case of CBRNE equipment, the threats involved are new and, until recently, largely unquantified. Nonetheless, progress has been rapid, and the IAB's SubGroups have identified the requirements that form the basis of a number of standards programs underway. Those nearest to completion include upcoming NIOSH standards for:

- CBRN Powered Air Purifying Respirators (PAPRs) (FY 2005)
- CBRN Air Purifying Respirators (APR) Retrofit Kit (FY 2005)
- CBRN Combination SCBA/PAPR (June 2005)
- CBRN Combination SCBA/APR (March 2006)
- CBRN Closed-Circuit SCBA (December 2005)
- CBRN Supplied-Air Respirators (SARs) (September 2006)
- CBRN Combination SCBA/SAR (June 2007)
- Development of Standard and Evaluation Criteria for Biological Detection
- Development of Standards and Evaluation Criteria for Commercial Chemical Detection Devices
- Development of Standards and Evaluation Criteria for Commercial Explosive Detection Devices
- Decontamination and Detection Commercial Standards Update

The Edgewood Chemical and Biological Center continues to conduct essential live agent and simulant-based research on chemical and biological warfare agents and their effects on the personal protective equipment (PPE) used by emergency responders. Additionally, Scientists from ECBC and Army Research Laboratory are collaborating in developing a rigorous test methodology that can be used as a benchmark for assessing the health effects assessments associated with the approximate levels of removal required during decon to reduce or eliminate all lasting health effects.

The National Protection Center in Natick, MA, is continuing its study of selectively permeable membrane technology, which has potentially important applications against CBRN agents. The NFPA1994 Technical Committee is reviewing its standard for ensemble technology in light of this study and expects to publish a revised standard in FY 2006.

NIST/OLES will continue its management of CBRNE standards development efforts, first funded by NIJ in FY 2001 - 02, then by DHS in FY 2003 - 04. Early on, these programs established the health and hazard assessment data since used by NIOSH to develop CBRNE SCBA and APR standards. Now these data, together with information from additional percutaneous assessments, are being used to develop protective ensemble standards and a chemical vapor detector standard.

In 2005 NIST/OLES's management role will be expanded to include standards programs for devices to detect chemical, biological, nuclear, and conventional explosive threats. Under NIST/OLES's leadership, an intensive effort by DHS, DOE, and NIST's Physics Laboratory produced a set of radiation detection standards published in FY 2004 by ANSI. Continued emphasis will be placed on testing and performance requirements for radiation detection equipment, including radiation pagers, portable instrumentation, and portal monitors.

The IAB-SCC recognizes the importance of appropriate training for many ongoing efforts and of the items listed within the SEL. The SCC recommended performance standards directly relating to equipment items on the SEL. Therefore, a strategic initiative, was presented at the San Diego meeting in February 2004 that, when applicable, the SEL communicate both the costs and training issues associated with listed items. The feasibility of how to present these recommendations is ongoing. It is anticipated that any training recommendations would be based upon existing training standards or educational competencies.

In Summary

The importance of standards in preparing for and responding to CBRNE threats cannot be overstated. The IAB's SubGroups are in the vanguard of America's effort to develop critical equipment standards as quickly as possible. By continuing to coordinate the activities of these SubGroups and harmonize them with the efforts of agencies and organizations throughout the public and private sectors, the SCC looks to make its own valuable contribution to the safety of first responders and the security of the United States.

SCC Chairs

Bruce Teele

Senior Safety Specialist
National Fire Protection Association

Bruce Teele is the Senior Safety Specialist at NFPA and has been with NFPA for nearly 36 years. He has served as the Staff Liaison for the emergency responder protective clothing and equipment project for 27 years. This project has responsibility for over 16 documents either under development or as part of the NFPA standards. Mr. Teele has a broad background with emergency services occupational safety and health, and coordinates safety and health issues between and among several governmental, industry, and private sector organizations and with the NFPA standards system.

Kathleen Higgins

Director, Office of Law Enforcement Standards
National Institute of Standards and Technology

Kathleen M. Higgins, Director, NIST/OLES, is a graduate of the University of Rhode Island, with a B.S. in Chemistry. Following college, Ms. Higgins worked as a toxicologist in the RI Department of Health. She earned a Master's degree in Forensic Chemistry at Northeastern University, did course work at Brown University in the fields of drug abuse and medical-legal autopsies, and co-founded a private forensic laboratory in Boston. Ms. Higgins also lectured at the Massachusetts Criminal Justice Training Center at Northeastern University, where she was coordinator of forensic programs. She managed material-development programs for the U.S. Postal Service Engineering and Development Center before joining NIST. Ms. Higgins is the author of several forensic science journal articles; a Fellow of the American Academy of Forensic Sciences; Past President of the Massachusetts Chapter of the International Association of Arson Investigators; and a member of several professional organizations, including the American Society for Testing and Materials (ASTM) E54 Committee on Homeland Security Applications (Chair), the ASTM E30 Committee on Forensic Science (Recording Secretary), the International Association for Identification, the National Fire Protection Association, the International Association of Bomb Technicians and Investigators, and the International Association of Chiefs of Police.

Mission

The S&T Committee's mission is to identify interagency (local, state, and federal) first responder research and development (R&D) requirements and innovative technologies (fieldable in the next 6 months to 5 years) that address CBRNE detection, individual protection, collective protection, medical support, decontamination, communications systems, information technology, and miscellaneous operational support.

Role and Functions

The primary functions of the S&T Committee are to develop and update the IAB S&T Requirements Matrix for inclusion in the SEL, coordinate IAB representation on federal requirements boards, record and collate requirements of individual SubGroups, report to SubGroups on federal requirement initiatives, and assess innovative government and industry-developed technologies. The IAB S&T Requirements Matrix (pages 38-44) identifies future technology needs for detection, individual protection, collective protection, medical support, decontamination, communications systems, information technology, and operational equipment.

Initiatives and Progress

During 2004, the S&T Committee accomplished the following:

- Designated SubGroup Chairs as mission area leaders responsible for detailed review and prioritization of S&T needs and projects.
- Reviewed the draft 2004 SEL to ensure future needs were included in the S&T Requirements Matrix.
- Reconciled the S&T Requirements Matrix with previous federal Interagency R&D requirements efforts.
- Updated the S&T Requirements Matrix for publication in the annual report.
- Prioritized SubGroup requirements for industrial and federal partners.

Science and Technology (S&T) Committee

Co-Chair

Vincent Doherty
Fire Department, City of New York (NY)

Federal Co-Chair

Gabriel Ramos
Technical Support Working Group

Membership

Les Boord
National Institute for Occupational Safety and Health

Brett Burdick
Virginia Department of Emergency Management

Christian Callsen
Austin - Travis County (TX) Emergency Medical Services

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

Christopher Lombard
Seattle (WA) Fire Department

Philip Mattson
National Institute of Standards and Technology, Office of Law Enforcement Standards

- Coordinated input into federal requirements meetings to leverage IAB-prioritized requirements submissions.

Ongoing Initiatives in 2005

Establish an "innovative technologies" reference database that provides information on type of emerging technical advances, status of development, industry or government source, and possible need for new standards development because of the emerging technology. The guide will cover the eight focus areas within S&T and will receive input from designated SubGroup Chairs.

James Schwartz
Arlington County (VA) Fire Department

Stephen Skowronski
Centers for Disease Control and Prevention

William Snelson
United States Marshal Service

Elaine Stewart-Craig
Research, Development and Engineering Command, Edgewood Chemical and Biological Center

Bruce Teele
National Fire Protection Association

Douglas Wolfe
Sarasota County (FL) Fire Department

Subject Matter Experts

Thomas Richardson
Seattle (WA) Fire Department

Instrumentation for the First Responder

By Vincent J. Doherty and Gabe Ramos

The identification of chemicals is an art that has been honed by academic and laboratory chemists for as long as the science of chemistry has been in existence. They create and certify the existence of the multitude of chemicals compounds and mixtures. In a laboratory setting, the chemist generally uses observation and instrumentation to identify and verify the identity of substances.

The emergency responder invokes a similar means of observation and less sophisticated instrumentation to accomplish the same objective of identifying hazardous compounds in a field setting. In some instances it becomes a race against time. To be more proficient in their mission, emergency responders have adapted the tools of the laboratory and applied them in the field. Emergency responders have also adapted a process of identification that begins with the initial response and ends with the successful mitigation of the incident.

The initial observation of clues to the identity of the released substance such as placards, labels, and size and shape of containers are the first steps that could produce possible substance identification, but, if these fail, detection and monitoring instruments must be employed. This equipment identifies the existence of a possible problem, though they do not identify the specific chemical or material, or even whether it poses a health or environmental problem. At times, it may be enough for the emergency responder to identify the threat and mitigate or secure the material without ever knowing the exact chemical makeup of the substance. At other times, especially when civilians or initial responders have been adversely affected, the race for identification becomes crucial. At this point the Incident Commander must have a working knowledge of what and why certain instruments are deployed instead of others and how to translate the data generated into useful information.

Ideally, environmental samples are best identified by professional chemists in a laboratory. Due to the urgency to identify potential hazards in a timely manner in the field, emergency responders are continually looking for methods and instruments to help them complete their missions. Incidents of environmental releases of hazardous materials, either accidentally or intentionally, become dynamic scenes that warrant substance and hazard identification to be crucial to a successful response and recovery operation.

Rapid identification is the initial phase of any incident involving an environmental release of an unknown and potentially hazardous substance. This is accomplished initially by observation of clues to narrow down the identification process. These clues include location of release, occupancy, container shape, labels and placards, signs and symptoms of victims, and any other obvious clue that presents itself. This can all be accomplished through initial reports from a scene and involves very little technical effort.

The second phase of response and identification is the observance of physical and chemical properties that cause the responder to take effective defensive or immediate offensive measures to lessen the effects. These include the state of matter of the material (solid, liquid, gaseous, or vaporous), the reactivity, the fluidity, and the environmental effects that could be brought to bear on the material's dissemination. These observances, though crude, sharpen with experience and, depending upon the proficiency of the emergency responder, could determine the initial success of defensive and/or offensive operations that will have a direct bearing on the overall successful closing of the incident.

The next phase would deploy detection instrumentation to establish safe perimeters of operations and to rule out hazards that may not be obvious at the beginning of the incident. This ruling-out process allows the emergency responder to progressively increase detection and identification capabilities to narrow the possibilities. The initial instrument would be a radiological detector to rule out radiation as an initial hazard. At this point in the observation and detection phase, the emergency responder should have determined whether the incident is of a chemical, biological, or radiological nature. Since chemicals make up the majority of our environment, they have received the most attention. Technology and

methods to detect and identify chemicals in the laboratory and the environment have taken prominence over biological and radiological materials.

The first concept for discussion is the difference between detection, monitoring, and identification instruments. They differ in a number of ways and are all critical at different phases of the emergency incident response.

Detection instruments are non-specific instruments that tell the user that a material is present in the sample and determine a specific hazard such as flammability or simply a concentration level without a specific hazard. Examples of detection equipment are the explosive meter, the Photo-ionization instrument, the Flame-ionization instrument, or the Geiger counter. Since the presence of solids and liquids are usually obvious and present less of a hazard than gaseous or vaporous materials, detection instrumentation is generally needed to identify hazards and materials that are present but not visible or sensed by odor.

Monitoring instruments monitor specific parameters and quantifies the results over a continuous time frame. These generally have continuous sampling capability that will monitor an area and warn the user if hazardous concentrations of material are present. Most detection and identification instruments have the ability to monitor an area, and manufacturers are increasingly making these instruments capable of recording and relaying data measured to central locations using both hardwire and wireless connections.

Identification instruments identify specific chemicals in the measuring matrix. This is completed by specific sensors that can qualify and quantify the specific chemical or by the use of increasingly diversified spectral analysis methods that identify the chemical by specific atomic or molecular spectra. The later methods use sophisticated techniques that, until recently, have been the sole domain of laboratory facilities, but have been increasingly available for mobile or on-site field analysis.

Manufacturers have combined multiple technologies into single instruments that have expanded the detection and identification capability of the emergency responder at the incident scene.

The following instruments are generally deployed immediately upon arrival of emergency responders when their use is anticipated. The first instrument deployed will rule out a radiological event. Given the correct circumstances, the next instrument simultaneously deployed is an environmental sampling device. This instrument provides immediate environmental readings that significantly affect the response posture of the first responders. If circumstances dictate a continued response by specialized personnel, more technical, specialized instruments will be deployed. These instruments use advanced methodology and should be deployed by properly trained personnel who have the capability to translate and interpret the data in a meaningful way to the Incident Commander. The following methods are offered in the order of suggested deployment, but may differ according to local protocols and circumstances. Each jurisdiction should develop individual protocols for the proper deployment and translation of recorded data.

Radiological Detection Devices

Purpose: Detection and quantification of radiological particles and radiation. Multiple types of instru ments are available according to the application. Personal dosimeters measure accumulated quantities of gamma and X-ray radiation exposure. Some detectors measure alpha, beta, gamma, and neutron radiation and can vary in specific particle or radiation measured to specific quantifiable ranges depending upon the probe used. There also are survey meters for larger area monitoring.

Methodology: Radiological detection devices consist of a detector, a meter with a scaleable readout, and a housing. The type of radiation and the range of the readings depend upon the detector used. The three most common detectors are as follows:

Geiger-Mueller (G-M) Detectors employ an electric field that causes the tube to discharge when radia tion ionizes a neutral gas molecule. Depending on the construction, they can be used to detect alpha,

beta, and/or gamma radiation.

Proportional Detectors are similar to G-M detection in that they utilize an electric field to produce a signal when radiation ionizes a neutral gas molecule. Depending on the construction, they can be used to detect alpha, beta, gamma, or neutron radiation.

Scintillation Detectors use a material that emits light when exposed to radiation. This light is then converted to an electrical signal by a photomultiplier tube. Depending on the construction, these detectors can be used to detect alpha, beta, gamma, or neutron radiation.

Limitations and Considerations: G-M detectors are popular because of their low cost and ease of operation. However, they do have a long dead time and are not capable of energy discrimination. Proportional detectors are inexpensive and easy to use, but they also are capable of energy discrimination. Drawbacks to this type of detector are the fragility of the windows, altitude dependence, and a constant need for gas replenishment (excluding sealed gas proportional tubes and air products). Scintillation detectors typically have good efficiency, low dead time, and energy discrimination capabilities. Photomultiplier tubes and scintillators are fragile. Depending upon the model and manufacturer, dosimeters can be purchased for $300 to $600. Depending upon model and detector, detector and survey meters can be purchased for $1 to $3000. Calibration should be scheduled on a yearly basis for approximately $50 per unit.

Radio Isotope Identifier Device (RIID)

Purpose: Identify specific isotopes producing radiation.

Methodology: The instrument reads and accumulates gamma spectroscopy data on an unknown radiological sample and compares the spectrum with a known sample.

Limitations and Considerations: Not all RIID instruments are alike. Some problems involve response time sensitivity, mis-identification, and ruggedness. Many of these instruments are delicate and cannot be placed in fire apparatus without being secured effectively. Instruments are priced between $7000 and $15,000 depending upon manufacturer.

Combustible Gas Indicator (CGI)

Purpose: Determines the concentration of flammable vapors in an atmosphere. Readings are indicated by a percentage of the lower explosive limit (LEL) as compared with a calibration gas used to calibrate the specific instrument. These instruments begin readings at 1% of the LEL of a chemical (1% equals 10,000 parts per million or ppm). If the flammability range of a chemical is 3 to 12%, then the instrument is capable of reading 1% of 3% of the LEL. Three percent of the LEL is 30,000 ppm, 1% of that is 300 ppm. That means the instrument can read a concentration of 300 ppm of that specific chemical. The ppm that the instrument is capable of reading is dependent upon the flammability range of the specific chemical, making this instrument very valuable to emergency responders.

Methodology (Whetstone Bridge): A combustion chamber is deployed within the instrument containing a filament and a balanced resistance chamber known as a Whetstone Bridge. The filament burns the gases; the higher the concentration, the higher the resistance. This resistance is measured as a ratio of combustible vapor present as compared with the total vapor required to reach the LEL of the calibration gas. This methodology has been used since the late 1800's to determine hazardous gas concentrations in mining operations and has passed the test of time and usage. It has been an essential part of the emergency responder's arsenal for decades.

Limitations and Considerations: Readings are dependant upon temperature and calibration gas. Instruments should be used at or near the temperatures at which they were calibrated to ensure consistent results. Relative response charts are used to correct readings on high carbon-containing materials. Organic lead-containing compounds, sulfur compounds, and silicone compounds could foil filaments; and acid gases tend to corrode the Whetstone Bridge. The CGI detects flammability of vapors and gases and does not identify compounds. Calibration can be accomplished by the user, and maintenance costs are relatively low.

Oxygen Indicator (O2)

Purpose: Used to evaluate the concentration of oxygen in an atmosphere so that assumptions can be made as to the breathability of the atmosphere, need for respiratory protection, or increased risk of combustion.

Methodology (an electrochemical sensor): An atmospheric sample is pumped or allowed to diffuse across a semi-permeable membrane into a sensor containing two electrodes and an electrolytic solution. The reaction of the oxygen molecules with the electrolytic solution produces a current that is directly proportional to the concentration of oxygen in the sample.

Limitations and Considerations: The accuracy of the oxygen reading is affected by elevation and temperature. The instrument must be calibrated at the temperature and elevation at which it will be used. The instrument directly reads the concentration of oxygen in the atmosphere. That concentration makes up one-fifth of the atmosphere. If 1% equals 10,000ppm, a drop in the reading of oxygen concentration of 1% actually is a drop five times that or 50,000 ppm, meaning that something is displacing the oxygen and could suggest that a hazardous condition is imminent. The readings in the open air should always be normal (20.8 to 21%). This parameter is more useful in an enclosed or confined space. Most calibration and maintenance can be accomplished by the user, reducing maintenance costs.

Carbon Monoxide (CO), Sulfur Dioxide (SO2), and Hydrogen Sulfide (H2S) and Other Chemicals

Purpose: These are specific gases that are common in fire buildings or found in confined and enclosed spaces. Many manufacturers produce instruments that have the capability of measuring LEL, O2, CO, and either H2S or SO2 or both.

Methodology (electro chemical cells or metal oxide semiconductors [MOS]): Electrochemical sensors use electrodes and an electrolytic solution. As the target chemical reacts with the specific sensor, it will produce a current that is directly proportional to the concentration. The MOS sensors change their conductivity when exposed to target chemicals, which is proportional to the concentration.

Limitations and Considerations: These sensors are more accurate than other methodologies, easier to use, and can analyze multiple samples before recalibration is necessary. They can be affected by temperature, and there are some cross sensitivities among chemicals. The technology can only monitor a limited number of pure chemicals, but those chemicals tend to be highly used by industry. Calibration can be accomplished by the user, and maintenance costs are relatively low.

*Note: Instruments containing CGI, O2, CO, H2S and/or SO2 sensors can be purchased for $1500 to $10,000 depending upon manufacturer and capability.

Photo Ionization Detector (PID)

Purpose: This technology detects low concentrations of toxic organic vapors. PID instruments typically measure concentrations from 0.1 ppm to between 2 and 300 ppm. This allows emergency responders to detect low toxicity at possible Immediately Dangerous to Life and Health (IDLH) levels at incidents and establish the need for respiratory protection early in the incident. Used in conjunction with the CGI, this duo of instruments identifies hazards present at scenes that may otherwise go undetected. Some manufacturers have combined the PID with the CGI, O2, CO, and H2S capability.

Methodology (photo ionization detector): All compounds contain electrons in their outer shells that can be ionized by a high-frequency radiation source, in this case, an ultra violet (UV) lamp. This lamp produces photons of UV radiation with specific energies that strike a specific compound in a sample, which in turn ionizes the molecule if the ionizing radiation is equal to or greater than the ionization potential of the compound. These charged particles are then collected onto a plate that measures the current produced. This current is proportional to the number of ionized particles.

Limitations and Considerations: There is a large range of ionization potential values for a range of compounds. Different lamps must be used to energize these compounds. If the energy is too low, it will not ionize the molecule. If it is too high, there is a risk of ionizing the oxygen and nitrogen in the

sample. Moisture in the air will fog the lamps, decreasing the energy and also decreasing the ionization potential of the compounds. Dust also affects the power of the light to ionize molecules. The lamps themselves are delicate and can become a problem to replace. Most users will have multiple instruments set up with different lamps. Remember, PIDs detect vapors in the sample but do not identify them. Experienced users may be able to identify chemical families in conjunction with other clues.

Flame Ionization Detector (FID)

Purpose: The FID uses a flame in a combustion chamber to ionize organic vapors. FIDs are specific for the detection of organic compounds.

Methodology (hydrogen flame ionization detector): A hydrogen flame is used to ionize organic com pounds, which produce ionized particles. These particles are collected on a plate that measures the current produced. This current is proportional to the concentration of the compound in the sample.

Limitations and Considerations: FIDs are specific to organic compounds and do not detect inorganic compounds such as chlorine, ammonia, or hydrogen cyanide. This is a detection meter and does not identify specific compounds. Emergency responders use this instrument as part of their arsenal to rule out specific chemical classes and further qualify other meter results. Initial purchase price is in the range of $10,000, and consumables such as hydrogen can bring operation costs to $2000 to $3000 per year.

Infrared Spectrophotometer (IR)

Purpose: This methodology is a portable adaptation of a standard laboratory compound-specific tool used by lab technicians to identify specific compounds. The instrument has been ruggedized for use in field applications and serves to identify unknown compounds within a short duration.

Methodology (infrared spectroscopy): Compounds can absorb radiation at specific infrared wavelengths depending upon the type, number, and length of their bonds. This energy absorption can be plotted as a spectrum, which serves as a unique fingerprint of each compound. The spectra generated are compared with a stored library in a computer program, and all likely results are reported. Units typically comprise sample preparation equipment, an infrared generator, a reading appliance, and a laptop computer. The equipment fits into a small case that is user friendly and is capable of reading solid and liquid samples.

Limitations and Considerations: Infrared spectrometers are new to the emergency response communi ty, but greatly increase the capability to identify unknowns in real time. The initial units were specific for solid sample identification, but manufacturers have since developed liquid and vapor sample identification capability. This is an advanced instrument that requires 16 to 24 hours of initial training to become proficient in its operation, followed by continuing familiarization to maintain competency. The manufacturers of these instruments will supply the initial training with reachback capability to scientists in the lab. The purchase price can be between $50,000 and $80,000 a unit, but maintenance and upkeep are low.

Gas Chromatography/Mass Spectrometer (GC/MS)

Purpose: This methodology is a recent transfer from the laboratory setting to a mobile, field instrument. Manufacturers have combined two technologies to produce a very effective tool for the identification of unknown vapors and liquids. GC is capable of separating and measuring components of a mixture in the parts per million and, in some cases, parts per billion range. The mass spectrometer portion of the instrument identifies mixture components and pure compounds by comparing spectrographs of the unknown products to known products.

Methodology (gas chromatography/mass spectrometry): A sample of gas is carried by a non-reactive carrier gas through a pre-packed column that separates components of the sample. These components move at different rates through the column and are measured using a mass spectrometer

(other detectors that are commonly used are FID, thermal conductivity detectors, electron capture detectors, or other detectors for specific molecules like phosphorus or nitrogen). This results in a spectrum that is compared with a known spectrum.

Limitations and Considerations: The largest drawback is the price of one instrument and the mainte nance involved ($100,000 plus for a new unit and an annual maintenance of $10,000 to $20,000 and the significant investment in training that could run between 30 and 60 hours per user). Multiple components of the unit include a non-reactive gas supply, a sampling device, a separation column, a heater for the column to vaporize the sample, a detector, and a computer to handle the data and compare spectra from a stored library. The increase in components increases the possible problems. Despite the training and cost, the instrument is invaluable to a response team in the hands of a knowledgeable, experienced operator.

Surface Acoustic Wave (SAW)

Purpose: The SAW instrument is a small, pocket-sized instrument that detects trace amounts of chemical warfare agents, both nerve and blister. It is simple to use and is a widely used instrument in the military arena.

Methodology (SAW Mini Chemical Agent Detector - SAW MiniCAD): The instrument uses two SAW sensors that are extremely sensitive to changes in the surface coatings of the sensors when exposed to the contaminants. Two separate responses are measured, the change in wave velocity and attenu-ation, to gain information on the contaminant absorbed by the coatings. The contaminant will be absorbed onto the coating of the sensor, which softens and causes the surface to become heavier, changing its properties as it relates to wave velocity and attenuation.

Limitations and Considerations: The SAW technology for the emergency responder was adapted from military chemical warfare agent detection technology. Manufacturers have recently used this technol-ogy to develop toxic industrial chemical capability. A number of research projects also are focusing on SAW technology in conjunction with nanotechnology to develop cutting-edge detection capability for the emergency responder community. The technology is relatively inexpensive, about $9000 per unit, and has low maintenance and training costs. This technology has a high value for the future.

References:

- Lindley, Barry N., and Appleton, Wayne C., "Street Smart Chemistry," Emergency Response Guide, Featuring Weapons of Mass Destruction," E. I. du Pont, 2003, pages 255-278.
- Bevelacqua, Armando, Hazardous Materials Chemistry, Delmar-Thomson Learning, 2001.
- Ludlum Measurements, Inc., Product Catalog, 2003.

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 01 Personal Protective Equipment				
01-01	Increased respirator protection factors	Land Warrior project	www.natick.army.mil	FY07 and beyond
		Computer-aided face fitting	NIOSH/NPPTL	FY06
		Face fitting measurements for high APF respirators	NIOSH/NPPTL	FY06
		Nano-fiber based respirator filter media	NIOSH/NPPTL	FY07
01-02	Improved flexibility of protective clothing	Next generation of turn-out gear for fire service/Improved Level A	www.tswg.gov	FY06
01-03	Decreased heat build-up of protective clothing	Drink System for Powered Air Purifying respirator (PAPR) and Self Contained Breathing Apparatus (SCBA)	www.tswg.gov	Technical Design Available
		Physiological models and countermeasures	NIOSH/NPPTL	FY08
01-04	Respiratory protection for persons in downwind hazard area	CB Escape Hoods	www.tswg.gov MSA ILC Dover Survivair	Available
		Low Cost Shelter In Place Equipment and Training for Public Buildings	www.tswg.gov	FY06
01-05	Multi-purpose canister/ cartridge designs that offer appropriate levels of respiratory protection against TICs, TIMs, CWAs & air-borne biological threat agents	Layered Bed Filter Canister	www.tswg.gov www.edgewood.army.mil	Technical Design Available
01-06	Lightweight, low cost personal cooling capability that offers cooling capability for duration > 2 hours for use with CPC	Body Armor Cooling System	www.tswg.gov www.technical-productsinc.us	Available
01-07	Lightweight, low-cost PPE tailored for Law Enforcement			FY06
01-08	Lightweight, low-cost PPE tailored for medical personnel in treatment facilities	DTAPS	Geomet level C DTAPS	Commercially Available
01-09	Improved Level "A" Chemical Protective Ensembles, lightweight, increased protection	Improved Level "A" ensemble	www.tswg.gov Inter-Spiro Gore	FY06
01-10	Next Generation Firefighter Bunker gear (turn-out coat, bunker pants, gloves and boots) systems that offer appropriate protection against chemical agents	Project Heroes, improved FF Bunker gear with CBR protection	www.tswg.gov www.iaff.org Morning Pride Globe	FY06
		Fully integrated, intelligent ensemble for firefighters	NIOSH/NPPTL	FY08

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 01 Personal Protective Equipment - Continued				
01-11	Pursue standard testing for all air respirators, APR, PAPR, SCBA	Improved Level A and Combined SCBA/PAPR	www.tswg.gov Interspiro/Gore Wilcox Draeger	FY06
01-12	Pursue standard testing for escape masks	Escape Hood Testing	www.tswg.gov www.niosh.gov/npptl	Available
01-13	Pursue standard testing for infant/child and respiratory impaired individuals	Escape Hood Testing	www.tswg.gov	Unknown
01-14	CBRNE, non-pass alert SCBA for non-Fire agencies	Tactical SCBA	www.tswg.gov TPI, MSA and Draeger	Unknown
01-15	End of Service Life Indicator for Filter Canister	End of Service Life Indicator	NIOSH, Army SBIR	Ongoing
		End of Service Life Indicator for respirator cartridges	NIOSH/NPPTL	FY08
SEL Category 02 Explosive Device Mitigation and Remediation Equipment				
02-01	Improved Bomb Suit with extremity and chemical protection	Next Generation Bomb Suit	www.tswg.gov	FY07
02-02	Large Vehicle Bomb Detection	Associated Particle Imaging Remote Detection Enhancements NQR Detection Technologies X-ray Based Screening System	www.tswg.gov Quantum Magnetics	FY07
02-03	Suicide Bomber Detection	Terahertz Detection Millimeter Wave Detection Non-imaging Detection	www.tswg.gov Qinetiq	FY07
02-04	Improved Handheld Explosives Detection	Next Generation Handheld Detector NQR Personnel Screening	www.tswg.gov	FY06
02-05	Enhanced Canine Detector Performance	Biological Detection Platform Improvements	www.tswg.gov	FY07
02-06	Improved Tactical Firing Device	Timed Tactical Firing Device Upgrade to Tactical Firing Device	www.tswg.gov	FY06
02-07	Improved IED Response Robotics	Joint Robotics Program	www.tswg.gov	FY07
02-08	Improved Disruptor Performance	Standoff and Long Range Disruptors	www.tswg.gov	FY06
02-09	Improved Intelligence Sharing	First Responders Automated Data Tool Technical Open Source Database	www.tswg.gov	FY06
02-10	Training for Security Guards and package Screeners	Explosives Simulant Kit	www.tswg.gov	Available

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 03 CBRNE Operational and Search & Rescue Equipment				
03-01	Portable Air Filtration for small enclosed spaces	Modular Portable Filtration Unit for small, enclosed spaces	www.tswg.gov www.germfree.com	Available
03-02	Victim Locator in collapsed buildings	Victim Locator Detector	www.tswg.gov	Unknown
SEL Category 04 Information Technology				
04-01	Centralized Security Event Auditing Tool (C-SEAT)			Unknown
04-02	Automate Nuclear Power Reactor/Chemical (Title III) Facility Cyber Assessment			Unknown
04-03	Railroad Bridge & Tunnel IDS System			Unknown
04-04	Electronic Wireless Command Board		FDNY	Unknown
04-05	Secure Knowledge & Information Exchange System	SKIES	HSARPA	Unknown
04-06	Tactical Telemetry (sensor array)	Sensor Web	www.tswg.gov JPL	FY06
Software				
04-07	User-friendly, multimedia Hazard Assessment tool	Palm-Top Emergency Action for Chemicals (PEAC-CW)	www.tswg.gov www.aristatek.com	Available
		Chemical Risk Assessment Tool	www.tswg.gov www.aristatek.com Georgia Tech	FY06
04-08	Computer models for predicting casualties following exposure to low levels of ionizing radiation, biological warfare and CWA aerosols	PEAC-CW	www.tswg.gov www.aristatek.com	Available
		Chemical Risk Assessment Tool	www.tswg.gov www.aristatek.com Georgia Tech	FY06
		Urban Dispersion Modeling	www.tswg.gov	FY07
04-09	Computer models for determining location of chemical, biological dispersal device based on limited point detection data		Los Alamos	Unknown
SEL Category 05 Cyber Security Enhancement Equipment				
05-01	Physical Protection applications for infrastructure cyber-terrorism			Unknown
05-02	Biometric User Authentication			Unknown
05-03	Evolving and new Anti-Virus architectures			Unknown
05-04	High-Impact Open Source Cyber Securities technologies			Unknown

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 05 CyberSecurity Enhancement Equipment - Continued				
05-05	Passive network Mapping Tool		www.tswg.gov	Unknown
05-06	Detection of Novel Attacks Against Public Servers		www.tswg.gov	Unknown
05-07	Cyber security initiatives			Unknown
05-08	Develop Standards for Cyber security applications			Unknown
SEL Category 06 Interoperable Communications Equipment				
06-01	Improved, interoperable communications systems	Small Portable Voice Radio Repeater System	www.tswg.gov	FY07
SEL Category 07 Detection				
07-01	Reduced size & cost of CBR sample collection devices	Concentration and Extraction System For Air Samples	www.tswg.gov	FY06
		Biological Aerosol Detector - Collector	www.tswg.gov LANL	FY05
07-02	Minute sample CBR collection capability	Chemical and Biological Sampling System (CBASS)	www.tswg.gov General Dynamics	FY06
07-03	Personal dosimeter	Personal Nerve Agent Alarm Monitor	www.tswg.gov	Prototype evaluated; commerci-cialization pending
		Smart Radiation Dosimeter	www.tswg.gov JP Labs	Available
07-04	Pager size alarming detectors(Chem/Bio/Rad)	Radiation Pager with Integrated Dosimetry, GPS, and 2-Way Communication	www.tswg.gov SMI	FY06
07-05	Stand-off detectors	Active LWIR for Facility Monitoring	www.tswg.gov	FY06
07-07	Broad spectrum agent detection	Biological Aerosol Threat Warning Detector	www.tswg.gov GE Global Research	FY06
		Facility Airborne Biological Toxin Alarm System	www.tswg.gov www.draper.com	FY06
		PCR-Less Detection of Bio Agents	www.tswg.gov www.nanosphere-inc.com	FY05
		Biological Aerosol Mass Spec (BAMS)	www.tswg.gov LLNL	FY07
		SmallCAD	www.tswg.gov www.saic.com	Available
		Detection of Toxic Adulterants in Food	www.tswg.gov	FY07

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 07 Detection - Continued				
07-09	Non-intrusive agent detection	Smart Radiation Dosimeter	www.tswg.gov JP Labs	Available
		Real Time Radioisotope Detection and Reporting	www.tswg.gov www.saic.com	FY06
07-10	Syndromic surveillance	Biodosimetry Assessment Tool	www.tswg.gov AFFRI	Available
07-11	Non-intrusive, Remote explosives detection			Unknown
07-13	Wide Area Metal Detection (WAMD)			Unknown
07-14	Building/Area CBR Detection and Alarm System	Facility Toxic Industrial Chemical Monitor	www.tswg.gov Avir	FY06
		Distributed Chemical Sensing and Transmission	www.tswg.gov IOS	Prototype Field Demo in FY05
07-15	Water system CBR Threat Assessment, Detection and Response	Water-borne Pathogen Detection Alpha and Beta Detection in Water	www.tswg.gov EPA	FY06/ FY07
SEL Category 08 Decontamination				
08-01	Mass, Gross decontamination protocols	Mass Personnel Decontamination Protocols	www.tswg.gov www.cbiac.apgea.army.mil	Available
08-02	Equipment/surface Decontamination Methods and Materials	Enzymatic decontamination	www.sbccom.army.mil	Unknown
		Ultraviolet light for biological materials		
		High pressure steam	www.cleanearthtech.com	
		Supercritical steam		
		Disinfection By-products Database		
		Electrostatic Decontamination System		
08-03	Personnel Decontamination methods and materials	Low Cost Personnel Decontamination System	Army's Edgewood Arsenal www.tswg.gov LLNL	FY06
08-04	Decontamination of high-value and difficult to replace equipment	Atmospheric Plasma Decontamination	www.tswg.gov Atmospheric Glow Tech	Available
08-06	Mass personnel decontamination with high velocity throughput, even in cold weather environments			Unknown

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
SEL Category 08 Decontamination - Continued				
08-07	Low cost liquid contamination containment vessels	WMD Overpack Bag	www.tswg.gov www.ilcdover.com	Available
08-08	Radiological decontamination methods and materials	Expedient Mitigation of a Radiological Release	www.tswg.gov Isotron Argonne National Lab DHS (S&T)	FY06
08-09	High temperature, high volume, portable incinerators for chemically, and biologically infected animal and contaminated material cremation	Plant and Animal Tissue Gasifier	www.tswg.gov EPA USDA	Unknown
08-10	Sensor technology for decon assurance	Sensor Web	www.tswg.gov JPL	FY06
08-11	Decon standards			Unknown
08-12	Chem/Bio Mitigation where evacuation is not an option	Expedient Chemical/Biological Release mitigation	www.tswg.gov www.battelle.org	Prototypes Available
SEL Category 09 Medical				
09-01	Syndromic surveillance (also covered in Detection)	Bio-dosimetry assessment Tool (BAT) Integration	www.tswg.gov AFRRI	Available
09-02	EMT Tools for Rapid Diagnosis of Chemical Agent Exposure	MD Biotech	www.tswg.gov	FY06
SEL Category 10 Power				
10-01	Reduce power requirements and battery weight to improve systems size/weight			Unknown
CBRNE Training Technologies				
TR-01	Crowd control at WMD incidents	WMD Panic Response Operations (WMD-PRO) Course	www.tswg.gov	Available
TR-02	Protection of food supply chain at national security events	Food Protection and Security Training for Critical and Overseas Facilities	www.tswg.gov www.cfsan.fda.gov	Preliminary Course materials Available
TR-03	Agricultural Bioterrorism Response Training	Agricultural Bioterrorism Response Training	www.tswg.gov www.aphis.usda.gov	Preliminary Course materials available mid-FY05

Requirement Number	Requirement	Project	Managing Agency/ Participant(s)	Availability
Miscellaneous				
MS-01	CB Building Protection Protocols	Nano-material and nanotechnology research and development Advanced Gel Based Air Filters	www.tswg.gov www.utrc.utc.com US Army Corps of Engineers	Available
MS-02	Absorptive & regenerative air filtration for public facility HVAC systems		www.raytheon.com www.dupont.com www.cimit.org www.tswg.gov www.ecolab.com	FY06
MS-03	Standards Coordinating Committee pursue standards for chemical, biological and radiological detection equipment			Unknown

S&T Chairs

Vincent Doherty

Executive Officer of HAZMAT Operations
Fire Department, City of New York

Captain Vincent J. Doherty is a 24-year veteran of the Fire Department of New York (FDNY) and is presently the Executive Officer of HazMat Operations and the former Company Commander of Hazardous Materials Company 1 (HazMat 1), the premier hazmat response unit for New York City (NYC). Captain Doherty holds a Bachelor of Science degree, School of Pharmacy, from St. John's University and a Master's of Arts degree in Security Studies, Homeland Security and Defense, from the Naval Postgraduate School, Monterey, CA. Prior to joining the Fire Service in 1981, Captain Doherty was a Research/Quality Control Chemist for Fisher Scientific, Diagnostics Division, in Orangeburg, NY. Captain Doherty is a contract instructor for the International Association of Fire Fighters, National Fire Academy, and FDNY and is currently the Chairperson for the S&T Committee of the IAB for Equipment Standardization and InterOperability. Captain Doherty is also a member of NYC's Federal Emergency Management Agency Urban Search and Rescue Task Force 1.

Gabriel Ramos

Chemical Biological Program Manager
Technical Support Working Group

Gabriel Ramos is a program manager for the Technical Support Working Group (TSWG). He provides management and technical oversight for the execution of the TSWG Chemical, Biological, Radiological, and Nuclear (CBRN) Countermeasures rapid research and development program. Mr. Ramos has over 18 years of experience developing and evaluating chemical/biological capabilities for the Department of Defense and the federal interagency Combating Terrorism community. Mr. Ramos received his Bachelor of Science degree in Chemical Engineering from the Polytechnic University, Brooklyn, NY. Mr. Ramos is also a graduate of the U.S. Army School of Engineering Logistics Product/Production Engineering Program.

Mission

The PP&OE SubGroup has the challenging mission of addressing issues of personal protective and operational equipment standardization and interoperability, and making recommendations for this equipment based upon anticipated hazards, risk assessment, and job functions. Personal protective equipment encompasses both protective ensembles (garments, boots, gloves, hood, and respiratory protection) and operational equipment (equipment and references needed to sustain operations and provide general support during CBRNE response operations). The PP&OE SubGroup efforts must be closely coordinated with those of the other IAB SubGroups, especially the SCC.

In order to meet the mission of the PP&OE SubGroup, the following areas of responsibility have been identified and are within the oversight of the SubGroup:

- Personal Protective Equipment
  - Respiratory Protection Equipment
  - Protective Ensembles
  - Tactical Law Enforcement Protective Equipment
  - Explosive Ordnance Disposal Protective Equipment
  - Accessories and Ancillary Equipment
- Explosive Device Mitigation and Remediation Equipment
- Operational and Search and Rescue Equipment
  - Logistics and Administrative Equipment
  - Optics
  - Rope Safety Equipment
  - Scene Control
  - Safety Equipment
  - Vehicles and Vehicular Support Equipment
- Reference Materials

Personal Protective and Operational Equipment (PP&OE) SubGroup

Co-Chair

Douglas Wolfe
Sarasota County (FL) Fire Department

Federal Co-Chair

Philip Mattson
National Institute of Standards and Technology, Office of Law Enforcement Standards

Membership

Armando Bevelacqua
Orlando (FL) Fire Department

William Chandler
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James Hanzalik
U.S. Coast Guard - National Strike Force

Martin Hutchings
Sacramento County (CA) Sheriff/National Bomb Squad Commanders Advisory Board

Eric Imhof
Contra Costa County (CA) Office of the Sheriff, Homeland Security Office

Role and Functions

The PP&OE SubGroup is actively involved with or supports the development of personal protective and operational equipment performance criteria and standards. In addition to responders, many members of the PP&OE SubGroup are also members of the IAB SCC, the National Institute of Standards and Technology (NIST), the National Fire Protection Association (NFPA) fire and emergency services protective clothing and equipment committees, and various committees of the ASTM International. These dual memberships serve to enhance partnerships between local, state, federal, military, and professional organizations and the standards development community. Through these partnerships, protective clothing, equipment, expertise, technologies, and standards are being developed. Ongoing federal and military research and development programs are being leveraged and, in some cases, fast tracked for the benefit of the emergency response and public safety community. This workgroup dynamic of bringing all "the players" to the table in a cooperative manner has been and will continue to be essential to the success of this workgroup.

Initiatives and Progress

The major initiatives completed in 2004 were the finalization of the Mission Objective Listing, future development of the respective areas of the SEL, and providing detail equipment information for the development of the Responder Knowledge Base (RKB) as it supports the SEL.

The Mission Objective Listing provides a general focus on roles of responders to potential terrorist events. Through this focal point, the PP&OE SubGroup strives to make personal protective and operational equipment recommendations to support each of those potential roles. Therefore, the PP&OE SubGroup is constantly comparing its recommendations with the mission in the street to ensure that it is meeting the equipment recommendation needs of the first response community.

The advent of the RKB, http://www.rkb.mipt.org, allows the PP&OE SubGroup's work efforts to populate that database and is resulting in a tremendous tool for the first response community. This "single point" information source for the tools and equipment of the job will ultimately benefit every first response agency. Those organizations struggling to come to grips with the equipment needs and standards requirements dedicated by the terrorism incident response mission can now find the authoritative

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International Association of Chiefs of Police

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International Personnel Protection

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National Emergency Management Association

information they need to make the right equipment-related decisions. As the RKB finishes its rollout, the PP&OE SubGroup will again be able to focus on the equipment standards advocacy issues that are so badly needed.

One of the hardest issues to come to grips with during 2004 was that of identifying a means by which commonly accepted terminology can co-exist with performance-based personal protective equipment standards. That means, how can the general descriptive terms "Level A, B, and C protective garments" be reconciled with specific performance standards NFPA 1991, 1992, and 1994 Classes I, II, and III? The fact is that there is no simple crosswalk of the terms to the standards. As a result, the PP&OE Sub-Group and subsequently the IAB as a whole endorsed and supported a cooperative effort of OSHA, EPA, NIOSH, NIST, and NFPA to develop a single classification system for CBRN protective clothing. A copy of the letter from the IAB to OSHA and other agencies follows (page 49).

October 27, 2004

John L. Henshaw
Assistant Secretary for Occupational Safety and Health
U.S. Department of Labor
Occupational Safety & Health Adminstration
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. Henshaw,

The InterAgency Board (IAB) is a user-working group supported by voluntary participation from various local, state, federal government, and private organizations.

The InterAgency Board (IAB) for Equipment Standardization and InterOperability Working Group is designed to establish and coordinate local, state, and federal standardization, interoperability, and responder safety to prepare for, respond to, mitigate, and recover from any incident by identifying requirements for Chemical, Biological, Radiological, Nuclear or Explosive (CBRNE) incident response equipment. A major effort of the IAB is to promote the development and implementation of performance criteria, performance standards and test protocols for CBRNE response equipment.

The IAB is requesting that appropriate agencies and organizations meet to bring clarity to an issue of significant importance to the responder community, the melding of two protective garment classification systems into one. These are the OSHA/EPA Level A/B/C/D system and the NFPA performance based system.

The IAB endorses the performance based system and encourages that a single system is in the best interest of respond safety. The IAB is willing to facilitate a forum to initiate this "harmonization" of systems in January or February of 2005. I have enclosed a copy of a resolution the IAB passed unanimously at the October meeting endorsing this project.

Additionally, the IAB reaffirmed its position that performance based standards be used for federal grant fund eligibility.

Thank you for your interest in responder safety.

Sincerely,

A.D. Vickery, Chair
InterAgency Board

This resolution, addressing PPE levels of protection, was passed unanimously by the IAB and enclosed with the letter on page 49.

PPE CLASSIFICATION HARMONIZATION

Whereas, there are two CBRN protective ensemble classifications systems utilized by the US emergency response community; and

Whereas, the first, the OSHA/EPA Level A/B/C/D system, is based on generic levels of protection. This system classifies ensembles as Level A as totally encapsulating and providing the HIGHEST respiratory protection and the HIGHEST level of cutaneous protection. Level B ensembles are those that provide the HIGHEST level of respiratory protection while providing a decreased level (compared to Level A) of cutaneous protection. Level C ensembles are those that provide a decreased level (compared to Level A including SCBA) of respiratory protection and a decreased level of cutaneous protection, and

Whereas, the second system, the National Fire Protection Association (NFPA) protective ensemble system, is based on specific performance requirements. In this system, technical committees develop specific measurable performance requirements for ensemble materials and ensembles based on the hazards responders face. In this system, performance requirements exist for vapor-protective ensembles (NFPA 1991 ed. & NFPA 1994 Class I), splash-protective ensembles (NFPA 1994, Class II and III) and splash-protective ensembles for use with toxic industrial chemicals (NFPA 1992) and

Whereas, a direct correlation between the two classification systems can not be made, and

Whereas the existence of these two classification systems creates great confusion within the response community and the corresponding purchasing authorities, and

Whereas the InterAgency Board believes that the development of a single performance based classification system is in the best interest of the safety of the first response community and the welfare of those they serve, therefore

Let it hereby be resolved, that the InterAgency Board strongly supports and encourages the efforts of the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), the National Institute for Occupational Safety and Health (NIOSH), National Institute of Standards and Technology (NIST) and the National Fire Protection Association (NFPA) to develop a single performance based classification system for CBRN Protective Clothing and Equipment.

Be it further resolved, that in accordance with HSPD 8 the InterAgency Board re-affirms its position that performance based standards shall be used for grant funding eligibility.

A document was developed through the efforts of members of the IAB PP&OE SubGroup, and coordinated and approved by NFPA, IAFF and other organization to provide the first-ever cross reference between NFPA standards and the OSHA A, B, and C Levels of protection. This document was completed in December 2004, and is incorporated in the FY2005 WMD grant guidance, and can be found through this link: http://www1.rkb.mipt.org/documents/AELPPENarrative.pdf. A copy of this guidance follows (page 51).

Comments on Changes to FY2005 AEL Personal Protective Equipment Section

Proper selection of Personal Protective Equipment (PPE) for individual responders must be based upon a careful assessment of two factors: 1) the hazards anticipated to be present at the scene and, 2) the probable impact of those hazards, based upon the mission role of the individual. Currently, no single personal protective ensemble can protect the wearer from exposure to all hazards. The FY2004 Grant Guidance on purchase of Personal Protective Equipment (PPE) used OSHA/EPA Levels A, B, and C to describe recommended personal protective ensembles. These levels are defined in the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER), 29 CFR 1910.120, Appendix B, as follows:

Level A - To be selected when the greatest level of skin, respiratory and eye protection is required.

Level B - The highest level of respiratory protection is necessary but a lesser level of skin protection is needed.

Level C - The concentration(s) and type(s) of airborne substances is known and the criteria for using air-purifying respirators are met.

While these definitions provide guidelines and a framework for discussing PPE, the descriptive narrative in these levels does not set minimum performance criteria required for specific threats, such as chemical permeation resistance and physical property characteristics. Thus the use of these general "levels" of protection does not describe the protective capability of such ensembles, and does not assure that the wearer is adequately protected from any specific hazards. Relying solely on these nomenclatures could result in exposure above acceptable exposure limits, or an unnecessary reduction in operational effectiveness through lack of mobility, decreased dexterity, or reduced operational mission duration.

In preparing the FY2005 Grant Guidance, ODP has aligned the AEL with the Standardized Equipment List produced by the InterAgency Board for Equipment Standardization and Interoperability (IAB) to the maximum extent possible. The mission of the IAB includes support to the development of hazard-based protective clothing and equipment performance standards. This includes performance standards for respiratory protective equipment, protective ensembles, garments, boots, and gloves for protection against chemical, biological, radiological and nuclear (CBRN) threats. Section 1 of the IAB's 2004 Standard Equipment List (SEL) defines the hazard environments for chemical, biological, radiological, thermal, explosive and ballistic threats. The IAB has also defined emergency responder mission roles in categories of law enforcement, fire department, emergency medical services, follow-on responders and special operations. The SEL provides a table that indicates the federal, or consensus-based equipment performance standards with which personal protective equipment should be compliant to assure appropriate protection against CBRNE hazards.

Following the IAB's recommendations, and in accordance with Homeland Security Presidential Directive (HSPD) 8[1], the FY2005 Grant Guidance defines eligible personal protective equipment in terms of nationally-recognized or U.S. Government standards. These standards require third-party certification, listing, and labeling of products; products may not claim compliance with them unless fully certified by an independent third party in accordance with the standard. For the NFPA standards, several commercial entities are able to provide the appropriate testing and certification. For the NIOSH respiratory protection standards, all testing and approval is provided by the NIOSH National Personal Protective Technology Laboratory (NPPTL). Several of these standards have already been officially adopted by the Department of Homeland security, including:

[1] Paragraph 15 of HSPD-8 states "To the extent permitted by law, equipment purchased through federal preparedness assistance for first responders shall conform to equipment standards in place at time of purchase. Other federal departments and agencies that support the purchase of first responder equipment will coordinate their programs with the Department of Homeland Security and conform to the same standards."

1) National Fire Protection Association (NFPA) 1994, Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents (Class 1, Class 2, or Class 3) for chemical and biological terrorism incidents. Note that certifications under NFPA 1994 are issued only to complete ensembles. Individual elements such as garments or boots are not considered certified unless used as part of a certified ensemble. Thus purchasers of PPE certified under NFPA 1994 should plan to purchase complete ensembles (or certified replacement components for existing ensembles).
2) NFPA 1991, Standard on Vapor Protective Ensembles for Hazardous Materials Emergencies, including the now-mandatory requirements for CBRN protection for terrorism incident operations for all vapor-protective ensembles.[2]
3) NFPA 1951, Standard on Protective Ensemble for USAR Operations, for search and rescue or search and recovery operations where there is no exposure to chemical or biological warfare or terrorism agents, and where exposure to flame and heat is unlikely or nonexistent.
4) NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations, for protection from blood and body fluid pathogens for persons providing treatment to victims after decontamination.
5) NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services.
6) NIOSH Chemical, Biological, Radiological and Nuclear (CBRN) Standard for Open-Circuit Self-Contained Breathing Apparatus.
7) NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR).
8) NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Air-Purifying Escape Respirator and CBRN Self-Contained Escape Respirator.

The following information is provided to assist emergency response organizations in transitioning from Levels A, B, and C to protection-based standards terminology. Because the OSHA/EPA Levels are expressed in more general terms than the standards and do not include testing to determine protection capability, it is not possible to "map" the Levels to specific standards. However, it is possible to look at specific configurations and infer their OSHA/EPA Level based on the definitions provided above. Some examples of ensembles and conservative interpretations of their corresponding levels are provided in the table below.

Ensemble Description Using Performance-Based Standard(s)	OSHA/EPA Level
NFPA 1991 with C/B Option, worn with NIOSH CBRN SCBA	A[2]
NFPA 1994 Class 1 worn with NIOSH CBRN SCBA	A
NFPA 1994 Class 2 worn with NIOSH CBRN SCBA	B
NFPA 1994 Class 3 worn with NIOSH CBRN SCBA	B[2]
NFPA 1994 Class 2 worn with NIOSH CBRN APR	C
NFPA 1994 Class 3 worn with NIOSH CBRN APR	C

All purchasers of personal protective equipment are cautioned to examine their hazard and mission requirements closely, and select appropriate performance standards. All personal protective equipment must be employed in accordance with 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (or equivalent EPA/state regulations). 29 CFR 1910.134, "Respiratory Protection" (or an equivalent state regulation) is also applicable in states with OSHA-approved health and safety programs and for federal employers. Both include requirements for formal plans, medical evaluation, and training to assure the safety and health of emergency responders. The ODP Fiscal Year 2005 Homeland Security Grant Program Guidance, the list of allowable equipment, and information on related standards, certifications, and products are all available on the DHS-sponsored Responder Knowledge Base (http://www.rkb.mipt.org).

[2] In the original version of this document (dated 12/02/04), this ensemble was rated as Level C. However, this rating was reconsidered by the PP&OE Subgroup on 03/03/05, and changed to Level B in recognition of its higher respiratory protection. The SubGroup also removed the reference to the Chem/Bio option of NFPA 1991, which is now become part of the basic standard.

PP&OE SubGroup Adopted Standards

The PP&OE SubGroup did not identify any new standards for adoption in 2004. The following table lists the standards recommended for adoption by the IAB in 2002 and 2003.

PP&OE SubGroup Adopted Standards Standard Development Organization and Title	Year Adopted
American National Standards Institute (ANSI) Standards	
ANSI Z89.1 - Protective Headwear for Industrial Workers	2003
ANSI/ISEA 105 - American National Standard for Hand Protection Selection Criteria	2003
ANSI/ISEA 107 - American National Standard for High-Visibility Safety Apparel	2003
National Fire Protection Association (NFPA) Standards	
NFPA 1936 - Standard on Powered Rescue Tool Systems (2005 edition)	2003
NFPA 1951 - Protective Ensemble for Urban Search and Rescue Operations (2001 Edition)	2002
NFPA 1971 - Standard on Protective Ensemble for Structural Fire Fighting (2000 edition)	2003
NFPA 1975 - Station/Work Uniforms for Fire and Emergency Services (2004 edition)	2003
NFPA 1976 - Standard on Protective Ensemble for Proximity Fire Fighting (2000 edition)	2003
NFPA 1981 - Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services (2002 Edition)	2002
NFPA 1982 - Standard on Personal Alert Safety Systems (PASS) (1998 edition)	2003
NFPA 1983 - Standard for Fire Service Life Safety Rope and System Components (2001 edition)	2003
NFPA 1991 - Vapor Protective Ensemble for Hazardous Materials Emergencies (2005 Edition)	2002
NFPA 1992 - Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies (2005 edition)	2003
NFPA 1994 - Protective Ensemble for Chemical/Biological Terrorism Incidents (2001 Edition)	2002
NFPA 1999 - Protective Clothing for Emergency Medical Operations (2003 Edition)	2002
NFPA 2112 - Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire (2001 edition)	2003
National Institute for Occupational Safety and Health (NIOSH) Standards	
NIOSH CBRN Standard for Open-Circuit Self-Contained Breathing Apparatus (December 2001)	2002
NIOSH Standard for CBRN Full Facepiece Air Purifying Respirator (APR) (April 2003)	2003
NIOSH Standard for CBRN Air-Purifying Escape Respirator (October 2003)	2003
NIOSH Standard for CBRN Self-Contained Escape Respirator (October 2003)	2003
National Institute of Justice (NIJ) Standards	
NIJ Standard 101.04 - Ballistic Resistance of Personal Body Armor (September 2000 edition) **	2003
Underwriters Laboratory (UL) Standards	
UL 913 - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations	2003

The PP&OE SubGroup did not recommend any additional standards for adoption in 2004. However, several NFPA, NIOSH, and ASTM standards are either under development or being revised at this time and will be reviewed in the coming months. These include the following:

- Revised/updated NFPA 1991 and 1992 standards
- NIOSH Powered Air-Purifying Respirator (PAPR) standard
- NIOSH Closed-Circuit Self-Contained Breathing Apparatus (SCBA).

Other standards will be reviewed as they are identified.

Recommendations for Standards Development and/or Support

The PP&OE SubGroup sees the immediate need for standards in the following areas:

- Continued and increased interoperability of SCBA cylinders. The Chairman of the IAB sent a letter to NFPA requesting that this interoperability be considered in the revised NFPA 1981 standard. A copy of this letter follows (page 55).
- A list of Toxic Industrial Chemicals (TICs) that addresses the likely hazards faced by the response community so that percutaneous toxicity assessments can be further analyzed. Currently, numerous such lists exist and they need to be reconciled:
  - This effort is currently being addressed through projects funded by the Department of Homeland Security (DHS), managed through the NIST, Office of Law Enforcement Standards (OLES), and conducted at the Edgewood Chemical and Biological Center (ECBC) and at the Natick Soldier Center.
- Protective ensembles for explosive device mitigation:
  - NIJ and DHS are funding development of a bomb disposal suit standard. This project is being managed by OLES and conducted at the Natick Soldier Center.
- Radio frequency jammers:
  - This is a new initiative to develop standards for electronic countermeasures against Improvised Explosive Devices. OLES is funding initial efforts on this project being conducted at NIST. Additional funding is being solicited from other sources to support this initiative.
- Portable (handheld) explosive detection devices (this requirement was passed to the D&D SubGroup):
  - Projects to develop standards for handheld trace explosive detectors and to develope Standard Reference Materials are being conducted at NIST. These projects are managed by OLES and supported by funding from DHS
- Explosive device mitigation equipment:
  - As mentioned above, projects for the development of standards for the bomb disposal suit and electronic countermeasures are being conducted at NIST and the Natick Soldier Center, managed by OLES and supported by funds from DHS and NIJ. Additional projects are scheduled for FY 2005 to develop standards and test methods for other types of explosive containment and mitigation equipment.
- Portable X-ray devices:
  - The current NIJ standard for X-ray imaging of bombs is being revised by OLES and will be promulgated through NIJ.

November 23, 2004

Casey Grant, Secretary
NFPA Standards Council
NFPA
1 Batterymarch Park
Quincy, MA 02269

Dear Mr. Grant,

On behalf of the InterAgency Board for Equipment Standardization (IAB), I am requesting that the NFPA address the issue of a Tentative Interim Amendment (TIA) to NFPA 1981, The Standard on Open-circuit Self-contained Breathing Apparatus for Fire and Emergency Services (2002 edition), to make interoperability of SCBA cylinders a requirement of the standard.

The InterAgency Board views this amendment as meeting the test of an emergency nature. This is due to the continuing threat of terrorism to our Country. An attack such as occurred in New York and the Pentagon graphically illustrates the multi-disciplinary requirements for interoperability. The need for SCBA air bottle interoperability is overdue to the sustainment of field operations in contaminated atmospheres.

We are requesting the Technical Committee make this a priority issue. The IAB understands there are technical and equipment issues that need to be addressed to make interoperability a reality. We also understand that some manufacturers may be reluctant to engage.

From a personal standpoint, subsurface divers currently have interoperability in cylinders without detrimental consequences. We are looking toward those of us on the surface having the same interoperability.

The IAB thanks the NFPA for its support and leadership in the field of responder safety.

Sincerely,

A.D. Vickery, Chair
InterAgency Board

Strategic Initiatives for 2005

The major strategic initiatives that were identified for the PP&OE SubGroup focus in 2005 are as follows:

- Finalize the PP&OE initial RKB rollout in early calendar year 2005. This includes updating the RKB to further align the Operational Equipment section with the Authorized Equipment List.
- Strengthen the SEL recommendations in the areas of tactical law enforcement, explosive device mitigation equipment, and urban search and rescue equipment.
- Provide guidance concerning the training impacts associated with equipment placed on the SEL.
- Provide guidance concerning the sustainment costs associated with listed equipment.
- Coordinate efforts with NIOSH/NPPTL, OSHA, and the DHS NIMS Integration Center (NIC) to develop and document the interchange of filters under emergency conditions that is allowed by the NIOSH CBRN APR stan dard. A decision support tool needs to be developed, approved, and distributed to support the Incident Commander in making the appropriate decision.

First Responder CBRNE Protective and Operational Equipment Standards Development Program

NIST/OLES has been managing a program to develop a suite of performance standards for emergency response and public safety community since 1999. The OLES also serves as the Secretariat for the IAB Standards Coordination Committee. A team was established between NIST, NIOSH, Edgewood Chemical and Biological Center (ECBC), and the U.S. Army National Protection Center (NPC) to develop these standards in coordination with various standards development organizations. This program was initially funded by NIJ. Funding was transferred to ODP in FY 2003; and in 2004, the program was transferred to the DHS Science and Technology (S&T) Directorate Standards Portfolio. The NIOSH/NPPTL CBRN respiratory protection standards were developed through this program. The major tasks that are currently being funded by DHS S&T in FY 2004 that pertain directly to the PP&OE SubGroup are as follows:

- Development of Respirator Standards for Chemical, Biological, and Radiological Agents. Currently, the PAPR standard is under development. Simulants for chemical warfare agents that allow respirator manufacturers to evaluate the performance of non-permeable materials are also being developed.
- Development of Verification Method for Gas Mask Fit Test. This effort, to develop calibration methods and supporting standards for quantitative fit testing of respiratory protection, is being conducted at NIST.
- Development of PPE and Membrane Technology Standards for Chemical and Biological Agents. The percutaneous hazards of Toxic Industrial Chemicals (TICs)/Toxic Industrial Materials (TIMs) are being examined and quantified as part of this program. This effort is being conducted at ECBC and NPC. The results of this program are being incorporated into NFPA standards development where applicable.
- Development of a Bomb Suit Standard. This project is jointly funded by DHS and NIJ, and the work is being conducted at NPC.
- Development of Urban Search and Rescue (USAR) Robot Standards. This project, being conducted at NIST, is developing performance standards and metrics for USAR robots.

NIJ is funding the following major tasks that relate to PP&OE. These projects are being managed by OLES, and the work is being conducted at NIST.

- Development of performance standards and metrics for bomb disposal robots

- Studies on the performance of ballistic body armor
- Revision of the NIJ standard for ballistic helmets.

OLES is supporting the development of human/machine interface standards and metrics for USAR robots and bomb disposal robots.

OLES has been using the recommendations and priorities developed by the IAB as critical components of the justification for funding requests from NIJ and DHS. The multi-year program plan managed by OLES to develop the full suite of first responder CBRNE protective and operational equipment has successfully transitioned from NIJ sponsorship to ODP and then to DHS S&T. Not only has the program remained intact, but it has been significantly expanded in the past two years. The program expansion and new tasks, particularly in the operational equipment area, reflect the new IAB priorities identified in this report. This linkage of IAB priorities and requirements is continuing in the 2005 programs being funded by DHS, NIJ, and OLES and managed by OLES.

PP&OE Chairs

Douglas Wolfe

Captain, Special Operations Coordinator
Sarasota County Fire Department

Captain Douglas E. Wolfe is the Special Operations Coordinator for Sarasota County (FL) Fire Department and has served with the IAB PP&OE SubGroup since 1999. With 22 years in the Fire Service, Captain Wolfe has spent 15 in Hazardous Materials emergency response. He is adjunct Faculty for the National Fire Academy (NFA) and is co-author of numerous hazardous materials and terrorism response training programs for the NFA, the FBI National Academy, NASA, and numerous other state and federal organizations. He is the Florida Professional Fire Fighters' nominee to the Florida State Emergency Response Commission and serves on the Florida State Working Group for Domestic Security.

Philip Mattson

Program Manager, Critical Incident Technologies
Office of Law Enforcement Standards,
National Institute of Standards and Technology

Philip J. Mattson is serving as the Program Manager for Critical Incident Technologies with the Office of Law Enforcement Standards (OLES) at the National Institute of Standards and Technology (NIST) and also serves as the Vice Chair of the NIST Homeland Security Strategic Working Group. At OLES, he manages programs with multi-agency funding to facilitate the development of a national suite of standards for Chemical, Biological, Radiological, Nuclear, and Explosives protective and operational equipment for the emergency response community. Mr. Mattson is a retired Army officer, serving 20 years with the Corps of Engineers and as a nuclear physicist with the Defense Nuclear Agency and Defense Special Weapons Agency. He is the Federal Co-chair of the PP&OE SubGroup of the IAB, a member of the American Society for Testing and Materials E54 Committee on Homeland Security Applications and the American National Standards Institute Homeland Security Standards Panel, and participates on the National Fire Protection Association technical committee for protective equipment. Mr. Mattson is also on a part-time detail to the Department of Homeland Security (DHS), Science and Technology Standards Portfolio, where he manages the Emergency Preparedness and Response portfolio of projects that includes the DHS funded protective equipment standards development efforts. He holds a Bachelor's degree in Nuclear Engineering Technology from Oregon State University and a Master's degree in Physics from the Naval Postgraduate School. He has received extensive training in nuclear weapons and radiological incident management and is a registered professional engineer.


IAB
"Out of Many, One"
Local, State, and Federal Standardization and Interoperability

Mission

The ICIS SubGroup's mission is to identify available equipment/systems and shortfalls for the coordination, exchange, and surety of information (both voice communications and data) before, during, and after a potential terrorist event using CBRNE or other means. Communications and information sharing in their many forms are the elements that tie together all of the diverse response organizations and disciplines required to address contemporary terrorism threats and perform vital homeland security missions.

Role and Functions

A high degree of interaction among the ICIS SubGroup, other IAB SubGroups and Committees, and the user and technology development communities is required to address the diverse needs of incident responders at all phases of operations (pre- and post-attack). Within the ICIS SubGroup, Christopher Lombard serves as State/Local Co-Chair and William Snelson serves as Federal Co-Chair. To effectively meet its broad mandate, the ICIS SubGroup expanded again this year, adding a new Cyber Security section to the pre-existing Communications, C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance), and Incident Management sections, forming four mutually supporting sections to address vital ICIS mission areas.

Accomplishments

In addition to updating and refining the SEL, ICIS SubGroup activities included participation at IAB general meetings, continued support to the National Memorial Institute for the Prevention of Terrorism's Project Responder and Responder Knowledge Base initiatives, as well as support to the Space and Naval Warfare Systems Center in Charleston, SC, to assess user requirements for data-mining, analysis, intelligence collaboration, geographic information systems (GIS) tools, and emergency operations center (EOC) collaboration. In addition, ICIS developed the following interim "Note" on communications system development.

Interoperable Communications and Information Systems (ICIS) SubGroup

Co-Chairs

John Sullivan (through October 2004)
Los Angeles County (CA) Sheriff's Department

Christopher Lombard (October 2004- Present)
Seattle (WA) Fire Department

Federal Co-Chairs

Charlie Bell (Deceased: August 21, 2004)
Seattle Fire Department

William Snelson (August 2004- Present)
United States Marshals Service

Membership

Joseph Booth (Alternate Co-Chair)
Louisiana State Police

Brett Burdick
Virginia Department of Emergency Management

David DeRieux
Naval Research Lab

Amy Donahue
University of Connecticut

Frank LePage
Department of Homeland Security, Office for Domestic Preparedness

Harlin McEwen
International Association of Chiefs of Police

Susan McGrath
Dartmouth College

Interim ICIS Note regarding Communications Standards

When procuring equipment for communications system development and expansion, a standards-based approach should be used to begin migration to multi-jurisdictional and multi-disciplinary interoperability. Specifically, all new systems should be compatible with the ANSI/TIA/EIA-102 Phase 1 (Project 25 or P25) suite of standards. With input from the user community, these standards have been developed to allow for backward compatibility with existing analog systems and to provide for interoperability in future systems. The FCC has chosen the P25 suite of standards for voice and low-moderate speed data interoperability in the new nationwide 700 MHz frequency band, and the Integrated Wireless Network (IWN) of the U.S. Justice and Treasury Departments has chosen the Project 25 suite of standards for their new radio equipment. P25 has also been endorsed by the U.S. Department of Defense for new LMR (Land Mobile Radio) systems. However, the first priority of federal funding for improving public safety communications should be to provide basic, operable communications within a department with safety as the overriding consideration. Funding requests by agencies to replace or add radio equipment to an existing non-P25 system should be considered if they include an explanation as to how their radio selection will allow for improving interoperability or eventual migration to interoperable systems.

In addition, ICIS continues to pursue the following issues:

- Monitoring and advocating development of Operational Space (OpSpace) Visualization Tools
- Continuing advocacy and monitoring of Tactical Telemetry tools (i.e., wireless fusion and interoperability of sensor information from the "forward information zone" to incident command posts and "rear information zone" [e.g., operations centers, etc.]).

Current ICIS Priorities

The issues addressed by the ICIS SubGroup are complex and require a high degree of coordination in order to effectively articulate user requirements and stimulate technological innovation and development of interoperable doctrine for the public safety and homeland security communities. Issues identified and restated as ICIS priorities for the coming year are as follows:

J. Robert McKee
Texas Engineering Extension Service

Mark Stanford
Texas Forrest Service

John Sullivan
Los Angeles County (CA) Sheriff's Department

Subject Matter Experts

Ronald E. Brooks
Northern California High Intensity Drug Trafficking Area

Matt Devost
Terrorism Research Center and Technical Defense Inc.

Don Hewitt
Terrorism Research Center

Mark Jacobs
Special Operations Forces Activity, Joint Forces Group

Malcolm Johnson
U.S. Northern Command

Walt Kaplan
Department of Homeland Security, Prepositioned Equipment Program

Rob Sawyer
Los Angeles County (CA) Office of Emergency Management

- Development of Cyber Security Requirements to protect information systems and technology required to support terrorism response capabilities at all phases of operations (i.e., pre-, trans- and post-incident).
- Geospatial Intelligence (GEOINT) including visualization and the need for a geospatial standard(s)
  - Mapping tools, GIS, symbology, link geospatial with data-mining
  - Modeling standards (especially for fate and transport - i.e., plume models, etc.).
- Information/Data Fusion (including geospatial, data-mining, production, dissemination, and distribution)
  - Need for interoperability and a continuity of operations (CONOPS) for use of software agents and development of secure portals/data exchange
  - Need to integrate cyber security/surety into all tools.
- Adaptive Bandwidth Management.
- Virtual Reach-Back (data, voice, video, multi-media) and Tactical Telemetry (sensor arrays).

To convert these priority issues into useful products and practices for the responder communities, ICIS recommends prioritizing these tasks and critical technology initiatives into two tracks: fast track and longer range.

Fast track initiatives/needs include the following:

- Tactical Telemetry (moving information and integrating sensor arrays to transmit information from a "forward information zone" to a "rear information zone." The forward information zone includes the exclusion (hot), contamination reduction (warm), support (cold) zones, including an incident command post and intelligence support functions. The rear information zone includes operational and strategic entities, such as emergency operations center, department operations center, joint operations center and intelligence support.
- Interim Geospatial Standards (standard symbology for geospatial applications for GIS data exchange).
- Interim Fate and Transport (plume model) Standards.
- Definition of User Requirements for Cyber Security (security and surety of data and information-sharing systems and networks).

Longer- range initiatives/needs include the following:

- Identification of Standards for Cyber Security (security and surety of data and information-sharing systems and networks).
- Standard Symbology for Geospatial Applications.
- Standards for Fate and Transport Models.
- Data-Mining and Exploitation/Visualization of Data-Mining Products.

CyberSecurity Team

The new CyberSecurity team is in the process of recruiting members and a cadre of subject matter experts to address the range of issues related to cybersecurity. Past ICIS Co-Chair John Sullivan was selected as CyberSecurity Team Leader. This new team will assist in identification of cybersecurity features for inclusion in the SEL, as well as work to integrate cybersecurity (security and surety of data and information-sharing systems and networks) requirements into all ICIS recommendations. This includes protection of all information, communications, C4ISR, and incident management capabilities, including sensors, tactical telemetry, geospatial, data-mining and analysis, and visualization tools. As part of the ICIS agenda for the coming year, the CyberSecurity team plans to examine cyber indications and warning (i.e., how to know a system or network is being attacked and what to do about it). This will expand

upon the "cyber target folder (response information folder) template" published in the 2003 IAB Annual Report. Finally, the CyberSecurity team plans to conduct an ICIS CyberSecurity Workshop in conjunction with the Institute for Security Technology Studies at Dartmouth College.

NIMS Team

In 2004, the Department of Homeland Security published two important new policies that will affect the nations' emergency responders. These are the National Incident Management System (NIMS) and the National Response Plan (NRP). The NIMS provides a template that describes how responders across the nation at all levels of government should work together to prevent, prepare for, respond to, and recover from domestic incidents of all types. The NRP provides the structure and mechanisms for coordinating federal-level incident support and/or management. The IAB reviewed these policies as they were developed and provided comments on them to the Department of Homeland Security. The IAB also recognizes that full nationwide implementation of the NIMS and NRP will rely on the development and application of technology and standards. IAB members have been involved with Department of Homeland Security-sponsored efforts to help specify these technology needs. A prominent example of this work is Project Responder, an initiative of the National Memorial Institute for the Prevention of Terrorism currently focused on the question of how technology can enable incident management practice and training. IAB members are providing inputs to this project. Over the next year, the ICIS SubGroup will identify existing technology for incident management that should be included on the SEL and in the Responder Knowledge Base.

ICIS Chairs

John Sullivan

Lieutenant
Los Angeles County Sheriff's Department

John P. Sullivan is a lieutenant with the Los Angeles County Sheriff's Department where he coordinates the interagency, multi-disciplinary Los Angeles Terrorism Early Warning (TEW) Group. He is also a researcher and practitioner specializing in intelligence, conflict studies, terrorism, and urban operations. He holds a Bachelor of Arts in Government from the College of William and Mary and a Master of Arts in Urban Affairs and Policy Analysis from the New School for Social Research. He is author, co-author, or editor of Policing Transportation Facilities, Policing a Multicultural Community, Jane's Unconventional Weapons Response Handbook, Jane's Facility Security Handbook, Emergency Preparedness for Transit Terrorism, and over 40 articles or chapters on terrorism, intelligence, policing, and emergency response. These have appeared in Networks and Netwar; Non-State Threats and Future Wars; Australian Police Journal; The Police Chief; Terrorism, Violence and Insurgency Report; Transnational Organized Crime; and Small Wars & Insurgencies as well as other journals.

Christopher Lombard

Communications Special Operations
Seattle Fire Department

Christopher Lombard works with the Seattle Fire Department where, in addition to working both in the operations division and as a dispatcher, he manages a variety of projects, including communications coordinator for the department's specialty teams; liaison for the department's interoperability with other jurisdictions; and project manager/coordinator for the department's mobile computing. He has been a member of the IAB and the ICIS SubGroup from their onset. He has a Bachelor of Science in Geography from Oregon State University. He is also involved in active communications-related roles on National Fire Protection Association (NFPA) 1221 (the standards committee for Public Emergency Service Communication), Federal Emergency Management Agency (FEMA), Urban Search and Rescue (USAR) teams, and as a Public Safety Communications Instructor at Texas A&M University/Texas Engineering Extension Service. Mr. Lombard has been in the fire service for about 13 years: Four years with the Corvallis Fire Department (Oregon State University) as a firefighter/medic and nine years with the Seattle Fire Department where he currently serves. Presently, his responsibilities include the coordination, management, and maintenance of communications equipment and policies for the Special Operations teams (including USAR, Metropolitan Medical Response Systems, Emergency Medical Service, etc.). Recent projects he has helped coordinate within the Department include Wireless Data Project (mobile computing), Interoperability Initiatives, and computer assisted dispatch/records management system upgrades. Memberships include: NFPA 1221 (Public Emergency Service Communication), IAB - ICIS SubGroup, and Project SAFECOM's Advisory Group.

ICIS Chairs

Charles Bell (1950- 2004)

Chief, Defense Consequence Management Systems Office, U.S. Marine Corps System Command

Charles R. Bell, founding member of the IAB, served as Chief, Defense Consequence Management Systems Office (DCMSO) assigned to the Program Manager NBC, Marine Corps Systems Command, Quantico, VA. The office is responsible for the Life Cycle Management of Consequence Management systems and equipment for numerous Department of Defense organizations assigned primary or secondary missions in support of local authorities in the event of a terrorist attack using weapons of mass destruction and served as the operational manager for the Office for Domestic Preparedness Prepositioned Equipment Program. The DCMSO also assists in the transfer of technology to local, state, and federal response organizations and the integration of military forces into response planning. Mr. Bell held a Bachelors degree in Economics and a Masters degree in Education from the University of Southern Mississippi. He was a graduate of the New York City Fire Department Hazardous Materials Technician (HAZTECH) Course, Northern Virginia Criminal Justice Academy Special Weapons and Tactics (SWAT) Course, and the Department of Defense Emergency Preparedness Course. Charlie passed away August 21, 2004.

William Snelson

Chief, Office of Emergency Management United States Marshals Service

William Snelson began his career 22 years ago when he joined the Buncombe County Sheriff's Department in Asheville, NC. While there, he became certified as a law enforcement instructor and jail school administrator. He was assigned various positions, including, Patrol Sergeant, Field Training Officer, Field Commander of the Tactical Unit, and Head of the Training Division. In 1991, he left the Buncombe County Sheriff's Department and joined the United States Marshals Service. He has worked as a criminal investigator in the field, the Internal Affairs Division, served as Assistant Chief of the District of Columbia Superior Court, the Chief Deputy of the Eastern District of North Carolina, and now serves as the Chief of the Office of Emergency Management. Chief Snelson is certified in numerous disciplines, including operating in hazardous environments. As part of his duties, Chief Snelson leads the Marshals Service's elite Hazardous Response Unit and oversees the Security Operations Unit for the Strategic National Stockpile.

Mission

The D&D SubGroup provides input, direction, standards, and information to first responders on equipment for sampling, detecting, identifying, quantifying, monitoring, and decontaminating weapons of mass destruction agent CBRNE contamination throughout designated areas or at specific points, and items that support detection activities.

Role and Functions

The D&D SubGroup is responsible for addressing equipment identification, interoperability, and standardization in three complex areas of detection and decontamination: chemical warfare agents (to include Toxic Industrial Chemicals, [TICs]), biological warfare agents, and radiological/nuclear materials. This work is accomplished by articulating user requirements for D&D equipment; identifying existing equipment guidelines or performance standards that address user requirements; and developing, maintaining, and updating the D&D portion of the SEL, which provides the responder a reference to the type of equipment required to prepare for, respond to, mitigate, and recover from a CBRN incident.

Goals

- Facilitate the exchange of information between the first responder community, government agencies, and the private sector, to include the sharing of knowledge, expertise, and technology regarding the detection, identification, warning, and decontamination of CBRNE incidents.
- Participate in the development and implementation of performance criteria, standards, and test protocols for D&D response equipment, and identify additional equipment and standards requirements.
- Facilitate and promote the standardization and interoperability of D&D capabilities to optimize response team integration and operations at the local, state, and national levels.
- Facilitate and promote the proper selection and use of the best available D&D equipment and procedures to optimize safety, interoperability, and efficiency.

Detection and Decontamination (D&D) SubGroup

Co-Chairs

Gene Ryan (through October 2004)
Chicago (IL) Fire Department

James Schwartz (October 2004- Present)
Arlington County (VA) Fire Department

Federal Co-Chair

Elaine Stewart-Craig
Research, Development and Engineering Command, Edgewood Chemical and Biological Center

Membership

Edward Bailor
U.S. Capitol Police

Charlie Brannon
National Institute of Standards and Technology

Stephen Clendenin
Massachusetts Department of Fire Services

John Eversole
International Association of Fire Chiefs/Chicago (IL) Fire Department

Alim Fatah
National Institute of Standards and Technology

Roger Hatfield
Nashua (NH) Fire Department

- Encourage governmental, military, and private agencies, as well as manufacturers, to sponsor priority research and development projects to satisfy local, state, and federal CBRN incident response equipment requirements.

Current Projects

The Department of Homeland Security's Science and Technology First Responder Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Protective and Operational Equipment Standards Development Program is continuing to develop performance criteria and test methods to allow manufacturers of chemical and biological equipment to produce useful equipment and the emergency response community to make knowledgeable procurement decisions. This program is executed in close collaboration with the National Institute of Standards and Technology (NIST), with the Office of Law Enforcement Standards (OLES) conducting the technical program management. The program involves many agencies and activities, including: the National Institute for Occupational Safety and Health (NIOSH); the U.S. Army Research, Development and Engineering Command's (RDECOM) Edgewood Chemical Biological Center, (ECBC); the U.S. Army National Protection Center at Natick, MA; the Dugway Proving Ground; American Society for Testing and Materials (ASTM); and the National Fire Protection Association (NFPA).

Development of Standards and Evaluation Criteria for Biological Detection Devices

The D&D SubGroup, along with the many responders across the nation, had articulated a need for performance criteria and test data for the bioassay tickets, currently available in the commercial market. To address this issue, the Department of Homeland Security funded a Task Force on Bacillus anthracisital to develop a program for evaluating the accuracy and usefulness of immunoassays. The studies were designed to demonstrate the reliability of candidate methods in many laboratories to detect Bacillus anthracis (BA) spores and discriminate BA spores from other related spores or spores that might be expected to be naturally present in the environment. Multiple laboratories participated in the collaborative study of the handheld assay methods. Dugway Proving Ground (DPG) was designated as the "lead" laboratory. The Federal Co-Chair of the D&D SubGroup, Elaine Stewart-Craig, was a member on the task force and provided input from the D&D SubGroup on possible interferents, based on white powders commonly encountered, i.e., flour or baking soda. Al Fatah and Jim Swartz of the D&D SubGroup assist-

Robert Ijames
U.S. Marine Corps Chemical Biological Incident Response Force

Robert Ingram
Fire Department, City of New York

Carroll Links
Civil Support Team

Robb Pilkington
University of Missouri Fire and Rescue Training Institute

Peter Stevenson
Environmental Protection Agency

Wes Thomas
Downers Grove (IL) Fire Department

Subject Matter Experts

Steve Beaumont
US Marine Corps Systems Command

Thomas Emsley
Program Executive Office for Chemical and Biological Defense

Gabe Ramos
Technical Support Working Group

Irene Richardson
U.S. Army Center for Health Promotion and Preventive Medicine

ed in the effort to determine the appropriate labeling on the immunoassay ticket inserts. Sandy Bogucki, a member of the Medical SubGroup, was also a task force member. The task force has released its findings; and, at this time, there are no field-use bioassay tickets that have met the task force's criteria.

Development of Standards and Evaluation Criteria for Commercial Chemical Detection Devices

A Chemical Warfare Vapor Detection standard is the first of what is anticipated to be multiple chemical agent detector standards to address this need. The Chemical Vapor Point Detector performance standards were set at a level to ensure that the detection instrument will provide the necessary information to allow for educated tactical decisions, especially when selecting protective equipment such as respirators and protective ensembles. The performance requirement for detection levels is based on health effects levels, Acute Exposure Guidelines (AEGL), and Immediately Dangerous to Life and Health (IDLH) values or levels. These detectors are expected to provide information to the first responders to allow them to determine the appropriate level of protective equipment, location of "contaminated/hot zone", and positioning of the decontamination station, traffic control, etc. These detectors do not provide sophisticated detection of devices or materials prior to their release, nor environmental-level measurements for restoration of contaminated facilities, but rather assist the emergency first responder in the actual response to an incident.

The initial version of the standard was released for public comment in July 2004 through the new ASTM committee E54, Homeland Security Applications. Subcommittee E54.01 Sensors, which included manufacturers, test facility representatives, and government personnel, wrote the first version of the standard. Many other organizations provided input to the initial version of the standard, including the IAB, which is the main contributor for recommending user requirements.

The comment period closed at the end of October 2004. The document will be revised/rewritten to incorporate the public comments and input from the Department of Homeland Security. The rewritten document will be re-balloted through ASTM E54.01 in early 2005.

Development of Standards and Evaluation Criteria for Commercial Radiological Detection Devices

The D&D SubGroup, recommended to the Standards Coordination Committee, which recommended to the general membership, the adoption of the four recently published American National Standards Institute (ANSI) Radiological Standards. The following standards were adopted:

1. N42.32-Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security
2. N42.33-Radiation Detection Instrumentation for Homeland Security
3. N42.34-Performance Criteria for Handheld Instruments for the Detection and Identification of Radionuclides
4. N42.35-Evaluation and Performance of Radiation Detection Portal Monitors for Use in Homeland Security.

Development of Standards and Evaluation Criteria for Commercial Explosive Detection Devices

The D&D SubGroup added an Explosive Detection Section to the SEL. The information in the section is very limited at this time. More guidance and input will be provided for next year's SEL.

Personal Decontamination Standards

The second year of the decontamination portion of the First Responder Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Protective and Operational Equipment Standards Development Program focused on gaining a better understanding of the most chaotic hazard dispersion method. Initial explosive dispersion tests of liquids were conducted to determine the quantity and specific bodysite of high velocity liquids that may be deposited on personnel and surfaces in a hot zone. Scientists from ECBC and the Army Research Laboratory collaborated in developing a rigorous test methodology that can be used as a benchmark for assessing future dispersion testing.

Information gathered from the health effects assessments is being used to model approximate levels of removal required to reduce or eliminate all lasting health effects.

The ASTM E54 Committee on Decontamination has begun a collection of currently available decontamination methods and standards.

D&D Commercial Standards Update

The following standards will be provided to the Standards Coordination Committee for evaluation by the IAB;

1. NSF/ANSI 5-2000 Water Heater, Hot Water Support Boiler
2. Association of Analytical Chemists (AOAC) test methods for Bio Handheld Detectors
3. Underwriters Laboratory (UL) Gas and Vapor Detectors and Sensors, First Edition dated November 5, 2004.

D&D Chairs

Gene Ryan

Deputy District Chief, Special Operations - Hazardous Materials Coordinator
Chicago Fire Department

Chief Ryan is a 24-year veteran of the Chicago Fire Department with 17 years of Hazardous Materials and Terrorism Response Experience. In 1999 he founded, and still currently serves as the Chairperson of the Chicago Terrorism Working Group. Chief Ryan is a hazardous materials and terrorism instructor for the Illinois Fire Service Institute as well as the National Fire Academy. In addition to serving as the D&D Sub-Group Chair, Chief Ryan serves as a member of the Illinois Terrorism Taskforce and is a Sub-committee Member for Bioterrorism and Crisis Response. He serves as response member of the Illinois State Weapons of Mass Destruction Team and as an on-scene advisor for State-wide hazmat response for MABAS. He is a voting member of the Chicago Local Emergency Planning Committee and Chairman of the Sub-committee on Emergency Response, as well as a member of the Illinois Department of Public Health Terrorism Task Force and the Department of Defense Executive Inoperability Counsel of Consequence Management Inoperability Service Program.

James Schwartz

Chief
Arlington County Fire Department

James Schwartz is the Fire Chief for Arlington County (VA) Fire Department. He was appointed to this position in June 2004. Chief Schwartz has been with Arlington for 21 years and served a variety of fire department positions before becoming Fire Chief. In 1997, Chief Schwartz was named Assistant Chief of Operations, overseeing all response-related activities, including fire, emergency medical services, hazardous materials, and technical rescue response, incident management, and operational training. While Operations Chief, he was also the Program Manager for the Washington area National Medical Response Team, which consists of local hazmat, EMS, and law enforcement personnel trained to respond to acts of terrorism and is pre-deployed to support special national security events in the Washington, DC, area. Beginning in April 2003, he was assigned to the Office of the County Manager where he served as the Director of Emergency Management until his appointment to Fire Chief. The Arlington County Fire Department consists of 305 personnel who provide fire, EMS, hazardous materials, and technical rescue response to a community of 198,000 residents in an area of 26 square miles. The Department was the lead agency for the response to the September 11 attack at the Pentagon. Chief Schwartz chairs the sustainment committee for Arlington County's Metropolitan Medical Response System, a federally funded program that focuses on the integration of a community's response capabilities for a terrorism event. He is a member of the International Association of Fire Chiefs' Committee on Terrorism and Homeland Security and is also a member of the Senior Advisory Board for the Responder Knowledge Base. Chief Schwartz graduated from the University of Maryland with a Bachelor's degree in Fire Administration.

D&D Chairs

Elaine Stewart-Craig

Chemical Engineer, Research, Development and Engineering Command
Edgewood Chemical and Biological Center

Elaine Stewart-Craig is a Chemical Engineer who has worked for the Edgewood Chemical and Biological Center (ECBC) for over 20 years. Her current assignment is Program Manager for the development of Chemical and Biological Standards for commercial equipment, including protective ensembles and detectors, to be used by the emergency response community in the event of a terrorist attack. This program is a joint effort between ECBC; National Institute for Occupational Safety and Health the National Institute of Standards and Technology and is funded by the Department of Homeland Security. She is a member of American Society for Testing and Materials Committee E54 Homeland Security Applications. She began her career in personnel protection equipment, designing and producing chemical/biological protective masks and filters for the military. She has been involved with quality assurance, strategic planning, and future business development for the ECBC. She has been involved in the area of Homeland Security/Defense since 1995. Mrs. Stewart-Craig earned her B.S. in Chemical Engineering from the University of Virginia and a Master's of Business Administration from Loyola College.

Mission

The MSG's mission is to provide guidance to the IAB on medical, public health, and incident health and safety equipment, supplies, and pharmaceuticals needed to respond to CBRNE events. This guidance is developed from member experience and discussion of relevant material. In addition, the MSG reviews and makes recommendations to the IAB on needs for new or modified equipment performance and operational standards.

The MSG strives to understand and document in the SEL and Responder Knowledge Base the generic medical, public health, and incident health and safety equipment, supply, and pharmaceutical capabilities to support responders, first receivers, and volunteers as they prepare for, respond to, and recover from CBRNE events.

Membership

MSG members represent local, state, and federal organizations and academic institutions. They are familiar with local, state, and federal plans, procedures, programs, guidance, functions, systems, and capabilities for public health and medical response. Current members have operational experience with the emergency medical system, primary and emergency medical care, hospital systems and operations, the National Disaster Medical System, disaster medicine and response, public health, law enforcement and special events operations, and emergency management. The MSG attempts to maintain active members who are involved in the public health and medical aspects of incident response and the use of and operational considerations for equipment, supplies, and pharmaceuticals during incident response. The MSG also supports the other IAB SubGroups with public health and medical representatives.

The MSG maintains contact with subject matter experts (SMEs) for assistance with specific topics or areas of interest. SMEs occasionally participate in MSG meetings to expand the breadth of knowledge and resources to the IAB as a whole.

Medical SubGroup (MSG)

Co-Chair

Christian Callsen
Austin-Travis County (TX) Emergency Medical Services

Federal Co-Chair

Stephen Skowronski
Centers for Disease Control and Prevention

Membership

Sandy Bogucki
Yale University Emergency Medicine

Kelly Burkholder-Allen
Medical College of Ohio

Richard Burton
Placer County (CA) Health and Human Services

Neal Dolan
U.S. Secret Service

Keith Holtermann
U.S. Department of Health and Human Services

Paul Maniscalco
National Association of Emergency Medical Technicians

Tim McAndrew
City of Las Vegas (NV) Office of Emergency Management

Role and Functions

The MSG participates in all aspects of the IAB. Due to the diversity of the medical mission, which includes the care of casualties as well as the health and safety needs of personnel participating in the management of the incident, the MSG routinely interfaces with each of the other IAB SubGroups. Specifically, the functions and roles of the MSG include the following:

- Participating in the IAB Standards Coordination Committee meetings to include medical, public health and incident health, and safety interests.
- Participating in the IAB Science and Technology Committee meetings to promote inclusion of medical, public health and incident health, and safety interests.
- Reviewing, improving, and updating the Medical section of the SEL and Responder Knowledge Base.
- Reviewing, improving, and updating other sections of the SEL and Responder Knowledge Base for integration of medical, public health, and incident health and safety needs.
- Understanding and documenting current and potential gaps and needs in medical, public health, and incident health and safety equipment and supplies.
- Supporting the development of new standards or modification and integration of existing standards that are needed for the medical, public health, and incident health and safety aspects of the response.

The majority of the equipment and pharmaceuticals utilized in the medical management of victims of a CBRNE event are regulated by the U.S. Food and Drug Administration (FDA). For that reason, the compilation of equipment and pharmaceuticals in the Medical portion of the SEL is commonly found in today's pre-hospital and clinical environments.

Accomplishments

- Representation on the American Society for Testing and Materials Hospital Preparedness Standards committee.
- Review of NFPA 473 and recommendation that the IAB endorse this standard.
- Draft of an initial framework and timeline for a concept of operations for emergency medical services,

Ken Miller
Orange County (CA) Fire Authority

Porter Shellhammer
Sarasota County (FL) Fire Department

Tom Skowronski
Phoenix (AZ) Fire Department

Lawrence Tan
New Castle County (DE) Police Department, Emergency Medical Services

Thomas Walsh
City of Seattle, (WA) Fire Department

Subject Matter Experts

Pete Brewster
U.S. Department of Veterans Affairs

Frank Cilluffo
George Washington University

Scott Deitchman
Centers for Disease Control and Prevention

John Ferris
Occupational Safety and Health Administration

Stephan Graham
U.S. Army Center for Health Promotion and Preventive Medicine

Paul Kim
The George Washington University/Response to Emergencies and Disasters Institute

John Piacentino
Occupational Safety and Health Administration

medical, and public health responders that will improve the understanding and use of information referenced in the Medical section of the SEL and include concepts on training and operations.

- Representation on Department of Homeland Security/Association of Analytical Chemists expert panel to evaluate and standardize specifications for handheld assays marketed to the emergency response community for identification of Bacillus anthracis in "white powder" incidents.

Initiatives and Progress

In 2005, the MSG plans to focus on the following items to improve the SEL and Responder Knowledge Base:

- Reviewing and improving information for public health responders.
- Adding useful references within the Medical section of the SEL, (i.e., Occupational Safety and Health Administration Recommendations for First Receiver Personal Protection Equipment document).
- Reviewing and improving incident health and safety information.
- Improving access to pharmaceutical information concerning special populations (i.e., pediatric, geriatric, pregnant, etc.) within the Medical section of the SEL.
- Continuing work on a concept of operations for EMS, medical, and public health responders with a goal to make this information available on the IAB Website.

The MSG will apply National Incident Management System concepts and principles in the development of guidance and recommendations.

Medical Chairs

Christian Callsen, Jr., LP

Division Commander
Austin-Travis County Emergency Medical Services

Christian E. "Chris" Callsen, Jr., LP, is the Senior Division Commander, Homeland Security and Planning for the Austin-Travis County Emergency Medical Services Department (A/TCEMS) in Austin, Texas. CMDR Callsen provides leadership in the areas of terrorism preparedness and response at a local, regional, and national level through his participation on the Austin/Travis County Counter Terrorism Planning Group, as chair of the Capital Area Planning Council's Homeland Security Task Force as well as his work as the State and Local Co-Chair of the MSG of the IAB. At A/TCEMS, Mr. Callsen is responsible for departmental strategic development, several areas of special response, including dignitary protection, counterterrorism, mass casualty and major events, and general system operational issues. Educated at Georgetown University in Washington, DC, and with more than 20 years of Emergency Services experience, CMDR Callsen's career in emergency medical services has included assignments as a flight paramedic, field training officer, clinical operations manager, and senior operational, management, and leadership positions across the United States. He has also worked in several areas of special operations including hazardous materials, tactical, urban search and rescue, and technical rescue.

Stephen Skowronski

Exercise and Preparedness Coordinator
Centers for Disease Control and Prevention

Stephen Skowronski was commissioned as an officer in the U.S. Army after graduation from the College of William and Mary in Williamsburg, VA. During his career, Stephen performed duties as a chemical decontamination officer; an aeromedical evacuation rotary wing pilot; a medical plans, operations, and training officer; and a Department of Defense medical liaison to domestic federal health and medical support (Emergency Support Function # 8). He participated in numerous domestic and overseas exercises and operations, including the Cuban refugee support in 1980 and Hurricane Bertha. Mr. Skowronski earned his Master of Public Administration degree from Sonoma State University in California. Following his military career, Stephen worked as the Department of Health and Human Services Regional Emergency Coordinator for Region 1 in New York City and Region 2 in Boston. He was the Emergency Support Function # 8 representative in Puerto Rico during federal support operations following Hurricane Georges. Mr. Skowronski began working for the Centers for Disease Control and Prevention in 2000. He worked with the National Pharmaceutical Stockpile Program (currently Strategic National Stockpile) before his current assignment with the National Center for Environmental Health, Public Health Emergency Readiness Branch. He has extensive training and experience with medical and public health preparedness activities, and in conducting joint and domestic medical evacuation operations. Mr. Skowronski has been a member of the IAB, MSG since 1999.

Strategic Plan for Developing a Suite of Chemical, Biological, Radiological, Nuclear, and Explosives Protective Equipment Standards

Executive Summary

A common suite of first responder equipment standards is needed to establish minimum performance and interoperability requirements for chemical, biological, radiological, nuclear, and explosives (CBRNE) equipment utilized by local, state, and federal first responders to acts of terrorism and CBRNE incidents. Such standards, and the associated requirements and test protocols, serve multiple purposes, including (1) establishing baseline capabilities and limitations for currently available equipment, (2) guiding production and technological developments by manufacturers and designers, and (3) guiding equipment procurement decisions by the public safety and health communities. This document presents the strategy and process within the InterAgency Board (IAB) for Equipment Standardization and InterOperability for identifying, adopting, modifying, and developing CBRNE equipment standards. The priorities for developing standards will be established and periodically reviewed by the IAB Standards Coordination Committee (SCC). 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, and it is a goal of the IAB to remedy this shortcoming.

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 local, state, and federal first responder functional and operational equipment requirements. These equipment requirements will be compared with existing standards to determine whether existing standards can be adopted into the CBRNE Equipment Standards Suite, modifications are required, or gaps exist requiring new standards to be developed. During the Implementation Phase, the recommendations of the equipment SubGroups will be coordinated with appropriate standards organizations 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 and managed by the SCC to periodically validate the suite and all incorporated standards.

The National Institute of Standards and Technology, Office of Law Enforcement Standards (NIST/OLES), as the executive agent for the SCC, will implement and administer the CBRNE Equipment Standards Suite repository, to include promulgation where appropriate. Implementation of this suite of standards is expected to be a multi-year process. In the interim, to address the user communities' needs for CBRNE equipment information, NIST/OLES, on behalf of the SCC, will publish and administer a first responder equipment set of guides to assist first responder agencies in making informed procurement decisions.

The Strategic Plan for Developing a Suite of CBRNE Protective 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 local, state, and federal 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 manufacturers and equipment developers and to serve as a guide for informed procurement decisions by criminal justice, medical/public health, and public safety agencies. The phrase "public safety and health communities" includes law enforcement, fire fighter, HAZMAT, emergency medical, and other related agencies that consist of the first elements to respond to public safety CBRNE incidents or attacks and also pertains to organizations that are involved in the mitigation and recovery phases of such attacks. 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, 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.

The IAB SCC will establish the prioritized order for developing or adopting standards and will periodically review and revise the prioritization as requirements change or as standards are implemented.

2.0 Goals and Objective

2.1 Goal of the CBRNE Equipment Standards Project -The goal is to enhance public safety and health by defining and promulgating a set of standards for CBRNE equipment that ensures minimum performance, quality, and reliability and that are accepted by public safety and health communities. This suite of standards will be disseminated to the local, state, 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 is to facilitate the adoption of standards that can be used by local, state, and federal public safety and health communities. To accomplish this, strong working relationships must be established with the public safety and health 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

The standards development process consists of 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 whether 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 (1) if existing standards can be adopted into the CBRNE Equipment Standards Suite (2) if they need to be modified before being adopted, or (3) 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 CBRNE 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 necessi-

ty, be restricted to a limited number of people who have the proper security clearances. The second step of the threat assessment will 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 Existing standards relevant to CBRNE equipment will be surveyed to identify any that can be used without any modification, as well as those that can be used with some modification. The SCC 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 SCC 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 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 SCC. Cognizant SDOs, SROs, and SEOs will be notified. These standards will be disseminated to the local, state, 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 SCC 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. In cases where existing standards are not able to be modified to meet the specific needs of the IAB, a new standard will be developed as discussed in paragraph 3.2.2. These modified standards will be disseminated to the local, state, 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, the identi-

fied requirement will be addressed through the issuance of a voluntary standard(s). These standards will be issued as National Institute of Justice (NIJ) standards. These standards will be disseminated to the local, state, 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 local, state, 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 local, state, 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 superseded 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

4.1 The key organizations within the IAB that facilitate the development of the CBRNE Equipment Standards Suite are the equipment SubGroups and the Standards Coordination Committee. The equipment SubGroups take the lead for developing the functional requirements for equipment in their commodity areas, in close collaboration with the user community. They also identify and recommend to the SCC existing 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 SCC, which includes the Chairs of the equipment SubGroups, will manage this process and will be principally responsible for implementation and management of the suite.

4.2 Standards Coordination Committee (SCC)

4.2.1 The SCC consists of a panel of representatives from various federal and private standards organizations, the Co-Chairs of the equipment SubGroups, and the Co-Chairs of the Science and Technology Committee. The SCC is responsible for coordinating CBRNE equipment standards projects of the IAB SubGroups with other organizations and enforcing authorities including, but not limited to, National Institute for Occupational Safety and Health (NIOSH), National Fire Protection Association (NFPA), Occupational Safety and Health Administration (OSHA), NIJ, Department of Energy (DOE), Federal Emergency Management Agency (FEMA), Environmental Protection Agency (EPA), and the NIST/OLES. As the various equipment SubGroups of the IAB determine minimum performance, quality, reliability, and other qualification requirements for their respective commodities, the SCC, representing regulatory, consensus, and voluntary standards organizations, will endeavor to create national harmonization by incorporating the requirements into its standards. The SCC 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.

4.2.2 In the absence of appropriate 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. NIST/OLES, as the executive agent for the SCC, will implement and administer the CBRNE Equipment Standards Suite, to include promulgation.

4.3 Equipment SubGroup - There are four equipment SubGroups established by the IAB. These SubGroups are composed of subject matter experts who address domestic preparedness equipment, systems, and protection issues related to a specific commodity area. The four equipment SubGroups are (1) the Medical SubGroup, (2) the Personal Protective and Operational Equipment SubGroup, (3) the Detection and Decontamination SubGroup, and (4) the InterOperable Communications and Information Systems SubGroup. Each SubGroup has two co-chairs, one from the ranks of the SubGroup's local and state ranks and the second from federal or private ranks. 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 CBRNE response concerns. Additionally, the SubGroups take the lead for developing the functional requirements for equipment, and identify and develop priorities for standards development within their respective commodity areas. The SubGroups identify existing standards that may be incorporated into the CBRNE Equipment Standards Suite without change, identify standards that may be incorporated into the suite after modification, and recommend areas for development of standards where none currently exist.

4.4 The Science and Technology Committee (STC) - The mission of the STC is to identify interagency (local, state, and federal) first responder research and development (R&D) requirements and innovative technologies (fieldable in the next 6 months to 5 years) that address CBRNE detection, individual and collective protection, medical support, decontamination, communications systems, information technology, and miscellaneous operational support. The STC consists of subject matter experts in the R&D field, the Co-Chairs of the equipment SubGroups, and the Co-Chairs of the SCC.

5.0 Execution

5.1 The CBRNE Equipment Standards Suite will be developed, promulgated, and administered as outlined above. The work will be conducted during regularly scheduled meetings of the IAB, and specially convened SubGroup sessions and by members of the SubGroups as directed by the SubGroup Chairs.

5.2 Standards Coordination Committee - The SCC will solicit input from the equipment SubGroup(s), consolidate input, and develop priorities for subsequent efforts, as outline in section 3.0. The SCC will develop, maintain, and publish the list of IAB adopted CBRNE protective equipment standards and develop a schedule for periodic review of these standards.

5.3 Equipment SubGroups - The equipment SubGroups will perform the steps outlined in section 3.0 according to a schedule developed by the Standards Coordination Committee.

5.4 NIST/OLES - The NIST/OLES serves as the executive agent for the SCC and implements, administers, and promulgates the CBRNE Equipment Standards Suite repository as appropriate. Additionally, NIST/OLES will publish, administer, and maintain a set of first responder CBRNE equipment guides. These guides will catalogue existing CBRNE equipment and their characteristics and will contain test data where available.

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