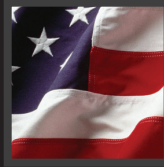
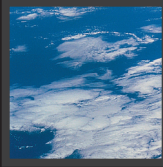




# *The InterAgency Board*

2008 Annual Report

2009 Standardized Equipment List



## Dedication

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Dedicated to those brave Americans who stand forever vigilant to protect this country from those who would attempt to deny us our freedom. May their strength give us strength.



## IAB Champions



44th Civil Support Team

Arlington County (VA) Fire Department

American Society for Testing and Materials International

Austin-Travis County (TX) Emergency Medical Services

Bioterrorism Response and Special Pathogens Laboratory, Rhode Island Department of Health

Bioterrorism Response Laboratory, Massachusetts Department of Public Health

Boston (MA) Fire Department

California Urban Search and Rescue Task Force 1

Centers for Disease Control and Prevention

Centers for Homeland Defense and Security

Chicago (IL) Fire Department

Cincinnati (OH) Fire Department, Homeland Security

City of Tulsa (OK) Security

Columbia (SC) Law Enforcement Division

Contra Costa County (CA) Office of the Sheriff

Cornell University

Dartmouth College

Delaware Emergency Management Agency

Department of Defense, Joint Program Executive Office for Chemical and Biological Defense

Department of Defense, Research, Development and Engineering Command, Edgewood Chemical and Biological Center

Department of Defense, Research, Development and Engineering Command, Edgewood Chemical and Biological Center

Department of Homeland Security

Department of Homeland Security, Domestic Nuclear Detection Office

Department of Homeland Security, Federal Emergency Management Agency

Department of Homeland Security, Federal Emergency Management Agency, National Fire Academy

Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Directorate

Department of Homeland Security, Federal Emergency Management Agency, Naval Postgraduate School

Department of Homeland Security, Federal Emergency Management Agency, Technology Support Branch

Department of Homeland Security, Federal Emergency Management Agency, Urban Search and Rescue Communications Working Group

Department of Homeland Security, Office of Health Affairs

Department of Homeland Security, Science and Technology Directorate

Department of Homeland Security, Science and Technology, Office of Research and Development

Department of Homeland Security, Science and Technology Directorate, Command, Control and Interoperability Division

Department of Homeland Security, Science and Technology Directorate, Office of Standards

DeWitt (NY) Fire District

Disaster Medical Assistance Teams

Douglas County (GA) Fire Department

Downers Grove (IL) Fire Department

Emergency Management, Cleveland Clinic, Cleveland, OH

Fairfax County (VA) Department of Public Safety Communications

Fairfax County (VA) Fire and Rescue Department

Fairfax County (VA) Police Department

Federal Bureau of Investigation, Hazardous Materials Response Unit

Fire Department, City of New York (NY)

Georgetown University Walsh School of Foreign Service

George Washington University

Grand Rapids (MI) Fire Department

Homeland Security Institute

Homeland Security, National Capital Region

InfrAegis

International Association of Chiefs of Police

International Association of Fire Fighters

International Personnel Protection

Jefferson County (CO) Sheriff's Office Bomb Squad

Kettering Fire Department/Ohio Task Force 1, Federal Emergency Management Agency Urban Search and Rescue

Lawrence (KS) Police Department

Lawrence Livermore National Laboratory

Long Island University/Naval Postgraduate School

Los Angeles County (CA) Fire Department



Los Angeles (CA) Sheriff's Department, Emergency Operations Bureau  
 Louisiana State Police  
 Louisiana State University Health Sciences Center- Shreveport  
 Louisville (KY) Metro Police Department  
 Marine Corps System Command  
 Maryland State Police, Emergency Operation Section, Special Operations Command  
 Massachusetts Department of Fire Services  
 Miami-Dade (FL) Police Department  
 Miami Township (OH) Division of Fire and Emergency Medical Services  
 Montgomery County (MD) Fire and Rescue  
 Mount Erie (WA) Fire Department  
 National Association of Emergency Medical Technicians  
 National Bomb Squad Commanders Advisory Board  
 National Disaster Medical System, Disaster Mortuary Operational Response Team  
 National Fire Protection Association  
 National Guard Bureau-J3  
 National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory  
 National Institute of Justice  
 National Institute of Standards and Technology, Office of Law Enforcement Standards  
 National Interagency Fire Center  
 National Interagency Fire Center, National Interagency Incident Communications Division

National Naval Medical Center  
 National Tactical Officers Association  
 Naval Facilities Anti-Terrorism/Force Protection Ashore Program Naval Surface Warfare Center Dahlgren  
 New Castle County (DE) Department of Public Safety, Emergency Medical Services  
 New York State Department of Public Health  
 New York State Police  
 Orange County (CA) Fire Authority  
 Orlando (FL) Fire Department  
 Orlando (FL) Police Department  
 Phoenix (AZ) Fire Department  
 Placer County (CA) Health and Human Services  
 Responder Knowledge Base  
 Sacramento County (CA) Sheriff's Department  
 Sarasota County (FL) Fire Department  
 Seattle (WA) Fire Department  
 Seminole County (FL) Fire Department  
 Seminole County (FL) Sheriff's Office  
 Snohomish County (WA) Fire District #7  
 South Central (PA) Counter-Terrorism Task Force  
 State of Montana Judicial Branch  
 Suffolk County (NY) Police Department  
 Technical Defense  
 Technical Support Working Group  
 Texas Task Force 1

Troy (MI) Police Department  
 United States Army Center for Health Promotion and Preventive Medicine  
 United States Army Natick Soldier Research, Development and Engineering Center  
 United States Central Command, J5, Combating WMD Division, Cooperative Defense Branch  
 United States Army Research Laboratory  
 United States Capitol Police  
 United States Coast Guard, National Strike Force  
 United States Department of Veterans Affairs  
 United States Environmental Protection Agency  
 United States Fire Administration  
 United States Marine Corps  
 United States Marine Corps, Chemical Biological Incident Response Force  
 United States Marine Corps Systems Command  
 United States Marshals Service  
 United States Occupational Safety and Health Administration  
 University of Connecticut  
 University of Montana, College of Health Professions and Bio-Medical Science  
 University of Toledo  
 Virginia Department of Emergency Management  
 Walker County (GA) Emergency Services  
 West County Emergency Medical Services and Fire  
 Yale Emergency Medicine





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The InterAgency Board (IAB) 2008 Annual Report and  
the 2009 Standardized Equipment List (SEL)

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**Robert J. Ingram**

*Branch Chief, WMD and Disaster Preparedness  
Center for Terrorism and Disaster Preparedness,  
Fire Department, City of New York*

Robert Ingram is a 35-year member of the Fire Service, 27 years with FDNY. He is currently assigned to the FDNY Center for Terrorism and Disaster Preparedness as the WMD Branch Chief. He has 25 years of experience in hazardous materials response and has worked on WMD issues since 1997. Chief Ingram's experience includes course development and training, FEMA urban search and rescue, field operations, interagency exercises, and standards development. He has been a member of the IAB since 1999 and is a member of the NFPA 472 committee and a member at large with the ASTM E-54.02 committee. He received a bachelors degree in fire and emergency management from the State University of New York, a certificate from the Fire Officers Management Institute from Columbia University Graduate School of Business and the FDNY, and a certificate from the Naval Post-Graduate Schools' Executive Leadership Program.

**Glenn P. Jirka**

*Deputy Chief of Operations  
Miami Township (OH) Division of Fire and Emergency  
Medical Services*

Chief Jirka began his career as a firefighter with the Savoy (IL) Fire Department while working on his postgraduate studies in analytical chemistry at the University of Illinois. During his career, Jirka served as a Field Instructor for the University of Illinois Fire Service Institute and a Program Manager for the University of Missouri Fire Service Institute, held an appointment as Adjunct Assistant Professor of Nuclear Engineering at the University of Missouri, and served as a member of Urban Search and Rescue Team Missouri Task Force One, including a deployment to the World Trade Center disaster on September 11, 2001. Chief Jirka is the author of several journal articles and book chapters; a member of the Advance Rescue Technology Editorial Board; and a member of several professional organizations, including the NFPA Hazardous Materials Protective Clothing and Equipment Technical Committee (Chair), NFPA Fire and Emergency Services Protective Clothing and Equipment Technical Correlating Committee, International Association of Fire Chiefs, Ohio Fire Chiefs Association, International Fire Service Training Association Hazardous Materials Committee, and the Ohio Department of Homeland Security Hazardous Materials Technical Advisory Committee. Jirka was recently recognized by the Greater Montgomery County Fire Chiefs as the 2005 Fire Fighter of the Year.



2008 was a very busy year for the InterAgency Board (IAB), with continued efforts from all members to positively affect the capabilities, safety, and health of all emergency responders. I am very proud to state that the IAB membership has worked hard to represent all emergency responder needs in our mission of identifying requirements for all-hazard incident response with a special emphasis on chemical, biological, radiological, nuclear, and explosive issues.

2008 was a year of continued strength and change for the IAB. We worked diligently to maintain our diverse emergency responder membership and provide our federal partners a prioritized, cross-cutting view of critical issues in technology, research and development (R&D), standards, training, and interoperability. The IAB SubGroups updated the Standard Equipment List (SEL) to include new technologies as they became commercially available and increase our input in urban search and rescue and swift-water equipment issues.

IAB Committee members worked diligently to prioritize issues and gaps in Science and Technology, Standards, and Interoperability and Compatibility areas. The final lists will be posted on the IAB website and forwarded to federal agency partners and have been presented at Department of Homeland Security (DHS) conferences already.

IAB members participated in working groups on several issues responders have determined are important:

- Development of the National Institute of Justice (NIJ) law enforcement personal protective equipment standard
- The DHS S&T/ASTM review of the Standard Practices for Bulk Sample Collection of Visible Powders on Non-Porous Surfaces (ASTM Standard E2458-06)
- The DHS S&T Stakeholders Panel on Agent (Bio) Detection Assays (SPADA) committee work on standards development for detection equipment
- International Association of Fire Chiefs and the Department of Transportation Pipeline and Hazardous Materials Safety Administration's Haz-Mat Fusion Center and Regional Incident Survey Teams

IAB members have provided comments and requirements information regarding the following:

- OSHA's Request for Information regarding seven Code of Federal Regulations pertaining to emergency response that are extremely outdated
- FEMA's National Preparedness Directorate's work revising the Target Capabilities List
- Requirements information to help maintain the Responder Knowledge Base (RKB) website quality level throughout a FEMA transition phase
- A position statement against an exception to the air-purifying-respirator (APR) cartridge to face-piece connection (40mm thread)
- A position statement identifying gap issues that still exist in the biological agent detection area
- A paper (draft still) on whether vaccine technologies should be included on the SEL

At our June meeting in Colorado Springs, the IAB celebrated its tenth anniversary since being organized by the U.S. Attorney General in 1998. Lt. Colonel Adriane Bogart, the original Department of Defense (DOD) Co-Chair, was on hand to help us mark this achievement. Bogey made a special presentation of a New York City Fire Department (FDNY) flag that he carried with him on three deployments in Iraq to Maureen Fanning, wife of FDNY Battalion Chief Jack Fanning, who was killed in the attacks on the World Trade Center towers and an original IAB member. As home to the

International Association of Fire Fighters Fallen Fire Fighters Memorial, Colorado Springs was the perfect setting for this presentation. More than a few tears were shed while listening to the heartfelt words of Lt. Colonel Bogart and Mrs. Fanning.

Most importantly, in 2008 the IAB convened a strategic planning group to lead a review of our current mission, our strengths and weaknesses, our goals for the next four years, and whether our current organizational structure best supports these goals. We worked through three board meetings and dozens of conference calls, group meetings, and e-mails. As you can imagine, this was quite a feat with such a diverse group of independent and vocal responders. The results are as follows.

**IAB Mission.** The mission of the InterAgency Board is to strengthen the nation's ability to prepare for and respond safely and effectively to emergencies, disasters, and CBRNE incidents.

**IAB Vision.** The IAB seeks to be the source for emergency responder insight about any policy, doctrine, practice, standard, research and development program, or training and exercise program that affects interoperability, compatibility, and standardization. The IAB will continue to be a trusted, authoritative, representative, and valid repository of field perspective, operational knowledge, and technical expertise.

**IAB Values.** The IAB purposely comprises a very diverse body of emergency preparedness and response experts, but is unified by a set of core values that frame its goals, shape its decisions, and guide its actions. These values are ground truth, independence, credibility, diversity, collaboration, and proactive orientation.

**IAB Strategic Emphasis.** In support of our mission and values, the IAB will pursue the following seven areas of emphasis: equipment; science and technology; standards coordination; best practices; training and exercise; information management and communications; and medical, health, and safety.

**Organizational Structure.** To achieve our new mission and vision, the IAB has added a second deputy chair position to the current chair and deputy positions. Under the direction of the chair, all three administrators will work to coordinate responder and federal partner issues, identify prioritized goals, develop agendas, direct and support SubGroup activities, and represent the IAB at key meetings and conferences. The SubGroups will align with the seven areas of strategic emphasis listed above.

I am very excited about the new mission and vision of the IAB and the healthy discussions and participation we had from the membership to finalize them. Under the guidance of our new leadership team, the IAB is in an excellent position to present critical emergency responder issues to the federal administration being appointed now under President Obama. The IAB should be recognized as the organization that federal agencies can go to for a single voice from diverse responder disciplines on critical issues. In 2009 final work will be completed revising the charter listed in this annual report to one that will represent the new organizational structure of the IAB.

Out of many voices, one set of priorities.

Sincerely,



**Robert Ingram**  
Chair, InterAgency Board



The InterAgency Board 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 Interoperability is designed to establish and coordinate local, state, and federal standardization, interoperability, compatibility, and responder health and safety to prepare for, train and respond to, mitigate, and recover from any incident by identifying requirements for an all-hazards incident response with a special emphasis on chemical, biological, radiological, nuclear, or explosive (CBRNE) issues.

### SCOPE

The IAB supports 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, compatibility, and efficiency.
- Developing, maintaining, and updating a Standardized Equipment List (SEL), which is aligned with the Authorized Equipment List (AEL) and provides the responder a reference to the type of equipment required to prepare for, train and respond to, mitigate, and recover from an all-hazards incident with a special emphasis on CBRNE issues.
- Advocating for, assisting in, and promoting the development and implementation of performance criteria, standards, requirements and test protocols for AEL/SEL-listed all-hazards incident response equipment with a special emphasis on CBRNE issues.
- Encouraging the coordination of local and state response communities with established military and federal acquisition programs for procurement of AEL/SEL-listed all-hazards incident response equipment with a special emphasis on CBRNE issues.
- Sharing knowledge, expertise, and technology regarding the detection, identification, warning, protection, decontamination, response management, and medical management of all-hazards incidents among local, state, and federal response communities with a special emphasis on CBRNE issues.
- Providing a structured forum for the exchange of ideas among operational, technical, and support agencies for national preparedness to promote interoperability and compatibility among local, state, and federal response communities.
- Identifying and prioritizing all-hazards incident response equipment requirements with a special emphasis on CBRNE issues.
- Encouraging manufacturers and governmental, military, and private agencies to sponsor priority research and development projects to satisfy local, state, and federal all-hazards incident response equipment requirements.
- Providing assistance and/or guidance to agencies, associations, and manufacturers, requiring operational testing of new and emerging equipment and technologies.
- Preparing and publishing an annual report to articulate the activities and accomplishments of the IAB.

## Organizational Structure and Responsibilities

- ***IAB Chairperson***—The IAB Chairperson 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 Chairperson is elected to a two-year term starting the first meeting of odd years.

If a vacancy occurs during term of the Chairperson, an immediate election process for a new Chairperson will be initiated.

- o The Vice Chairperson will act as the interim Chairperson for the duration of the meeting and election.
- o The Vice Chairperson is eligible to be nominated for this position.
- o If the vacancy occurs during a general meeting, nominations will be open from the floor through the end of the meeting. The nominations can include a member or members who are not present but have been contacted and will accept. During the brief-out sessions on the last day of the meeting, the Vice Chairperson will close the nominations and hold the election under the same simple majority guidance set out above. A new Chairperson will be elected for the balance of the term.
- o If the vacancy occurs between general meetings, the Vice Chairperson will be notified and will serve as the acting IAB Chairperson until a new Chairperson is elected. The Acting Chairperson will send an e-mail to the membership announcing the vacancy and that nominations will be open at the beginning of the next meeting and held open for the morning session. A vote will be held before the morning session ends, and a new Chairperson elected for the balance of the term.

The Chairperson administers, organizes, and facilitates the actions of the IAB. The Chairperson provides recommendations to the Federal Agency Coordinating Committee (FACC) and direction to the SubGroup chairs.

- ***IAB Vice Chairperson***—The IAB Vice Chairperson 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 Vice Chairperson is elected to a two-year term following the structure of the Chairperson election.

- o The Vice Chairperson supports the Chairperson effort to complete the tasks of the Chairperson as identified in the above section.
- o The Vice Chairperson will attend meetings that the Chairperson is unable to attend and IAB representation is valuable or necessary whenever available.
- o The Vice Chairperson will chair the strategic planning group whose objectives will include providing a clear vision of future projects and monitoring the IAB mission statement.
- o The Vice Chairperson will present the strategic planning group vision at the June meeting of each year.

If a vacancy occurs during term of the Vice Chairperson, the Chairperson will be notified, and the state and local chairperson of the SCC will serve as acting Vice Chairperson until a new Vice Chairperson is elected.

- o The Chairperson will send an e-mail to the membership announcing the vacancy and that nominations will be open at the beginning of the next meeting and held open for the morning session. A vote will be held before the morning session ends, and a new Vice Chairperson elected for the balance of the term.
- o If the vacancy occurs during a general meeting, nominations will be open from the floor through the end of the meeting. The nominations can include a member or members who



are not present but have been contacted and will accept. During the brief-out sessions on the last day of the meeting, the Chairperson will close the nominations and hold the election under the same simple majority guidance set out above. A new Vice Chairperson will be elected for the balance of the term.

- ***Federal Agency Coordinating Committee (FACC)*—A coordination committee that provides the interface between the IAB and sponsoring federal government agencies. The FACC consists of the federal officials from contributing agencies and departments. The FACC shall:**
  - Coordinate and leverage ongoing federal research, development, testing, and evaluation (RDT&E) efforts to meet the responder requirements as identified and prioritized 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 Chairperson and/or Vice Chairperson on a regular basis to review SubGroup recommendations and actions.
  - Meet to coordinate federal requirements for action by the IAB.
  - Attend general membership meetings.
  - 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 five SubGroups as listed below. The SubGroups are composed of subject matter experts who address domestic preparedness equipment, systems, and protection issues related to a specific commodity area. The role of each SubGroup is to maintain and update its portion of the SEL and to address the ways and means by which technology can support all-hazards response concerns. Additionally, the SubGroups take the lead for developing the functional requirements for equipment, identify interoperability and compatibility issues, and develop priorities for standards development within their respective commodity areas. The SubGroups identify existing standards that may be incorporated into the 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.
    - Personal Protective and Operational Equipment (PP&OE)
    - Detection and Decontamination (D&D)
    - Interoperable Communications and Information Systems (ICIS)
    - Medical (MSG)
    - Training (TSG)
  - ***Committees***—The IAB has three additional Committees:
    - Standards Coordination Committee (SCC) consists of SubGroup and Committee Co-Chairs or designated representatives and subject matter experts (SMEs) from various standards development organizations. The SCC is responsible for coordinating all-hazards equipment, training, and operational standards projects of the IAB SubGroups with other organizations and enforcing authorities. As the various SubGroups of the IAB determine minimum performance, reliability, quality, 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 their 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 requirements under internal development within the regulatory, consensus, and voluntary standards organizations; and,
  - › provide technical and nontechnical advice for improvements.
- Science and Technology (S&T) consists of SubGroup and Committee member representatives and SMEs in the R&D field. The mission of the STC is to identify interagency (local, state, and federal) first responder R&D requirements and innovative technologies (fieldable in the next 6 months to 5 years) that address all-hazards detection, individual and collective protection, medical support, decontamination, communications systems, information technology, training, and operational support.
  - Compatibility and Interoperability Committee (CIC) consists of member representatives and SMEs who address domestic preparedness equipment, systems, and protection issues related to specific interoperability and compatibility issues.
- *Co-Chairs*—Each SubGroup/Committee elects two Co-Chairs, one from the local and state ranks and a second from federal ranks. The Co-Chairs shall be elected for two-year terms with the elections for the local/state Co-Chair and the federal 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 Chairperson and/or Vice Chairperson.
    - Complete and provide to the chair, via the support staff, all administrative reports as required by the chair.
    - Serve as a member on the SCC.
    - 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.
    - Assign a SubGroup member representative to liaison with other SubGroups and committees as needed or directed by the IAB Chairperson and/or Vice Chairperson.
  - *Membership*
    - Participate in the SubGroups/Committees and lend expertise and support to the IAB Mission.
    - SubGroup/Committee membership will be limited to 20 voting members.
    - SubGroup membership may be augmented with additional SMEs, as nonvoting members, for specific projects, or with members of other SubGroups in a nonvoting 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 Chairperson and Vice Chairperson.
- Individuals may serve as voting members in only one SubGroup; however, they may participate in a nonvoting status in other SubGroups.

## EXECUTION

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

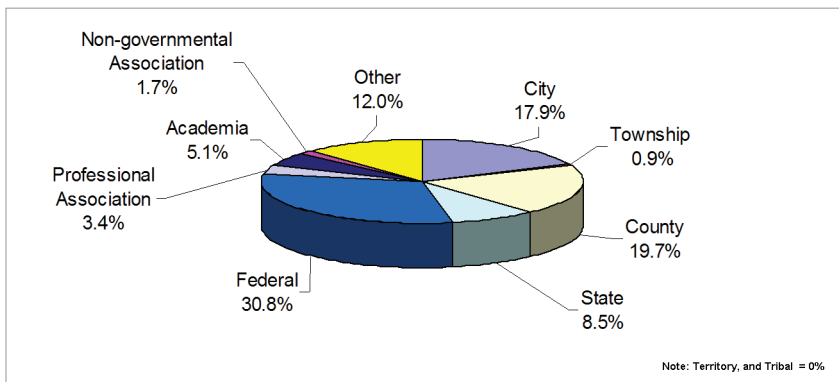
- Meeting agendas will be set by the IAB Chairperson and Vice Chairperson.
- Agenda work items shall include, but not be limited to, the following:
  - Publish an Annual Report of work.
  - SEL data development and publication.
  - Prioritization of equipment, standards, and training requirements.
  - Evaluation of existing standards that link to AEL/SEL items.
  - Establish the priority needs of the responder community regarding equipment, standards, interoperability and compatibility, and training issues and gaps.

In 2008, the IAB conducted a demographic survey of its membership. The results are shown in this section.

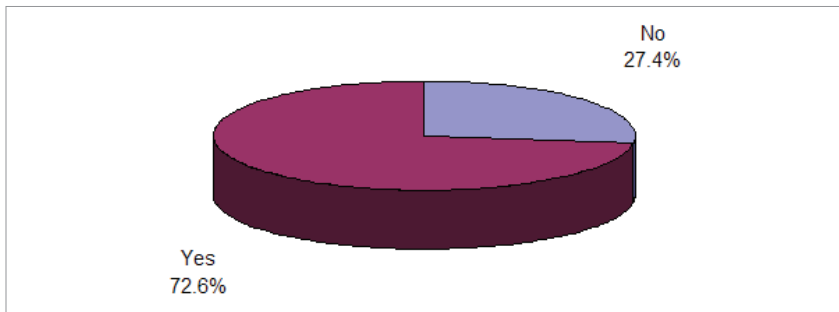
IAB membership comprises state, local and federal responders representing various disciplines, including fire, law enforcement, medical/health, emergency management, military, and emergency communications. The majority of the first responders are still active, have been in service for over 26 years, and work in jurisdictions with a population greater than 1,000,000. Approximately 75% of members are first responders/receivers, and 25% are SMEs. The SMEs represent governmental, academic, professional association, and information technology disciplines.

The graphics below show a detailed breakdown of the IAB membership.

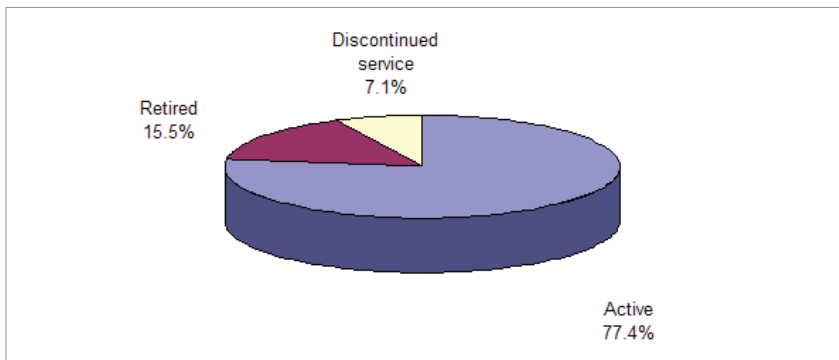
1. Organization and Jurisdiction Chart



2. Emergency Response or First Receiver

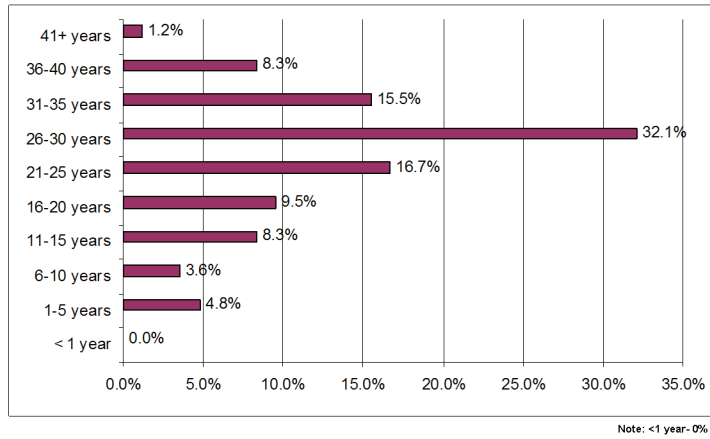


3. Current Responder Status

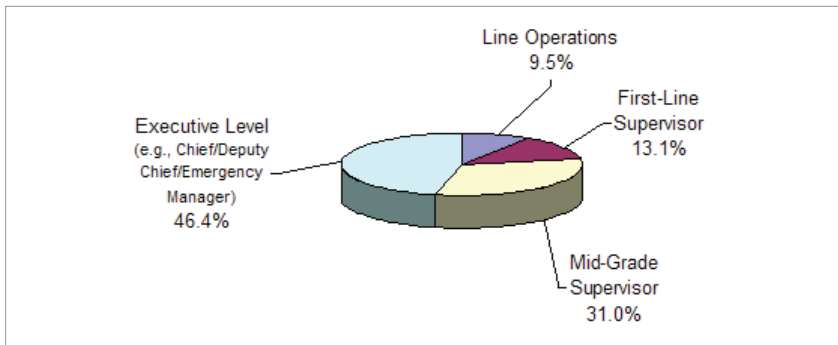




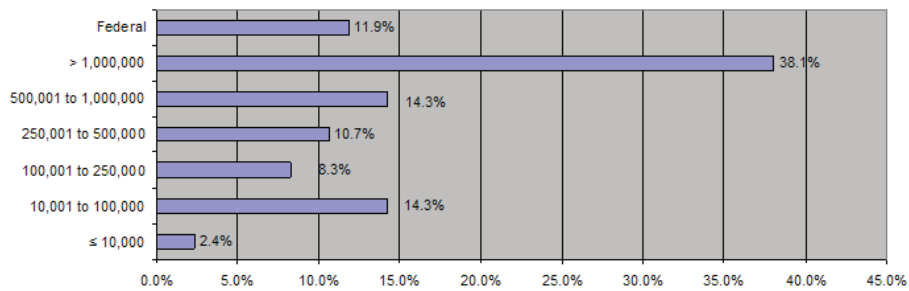
#### 4. Length of Service



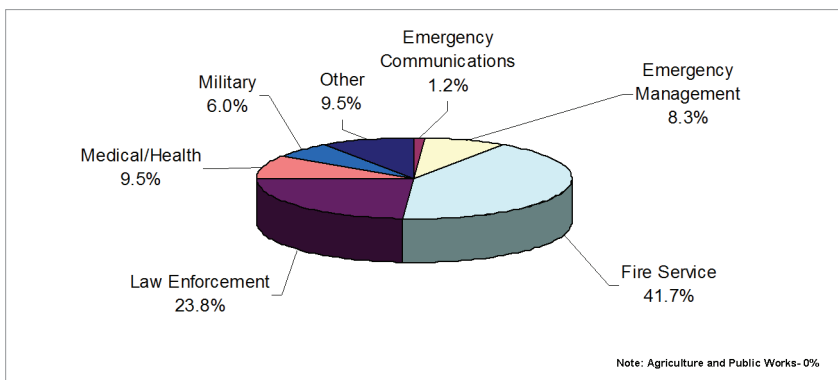
#### 5. Operational Level



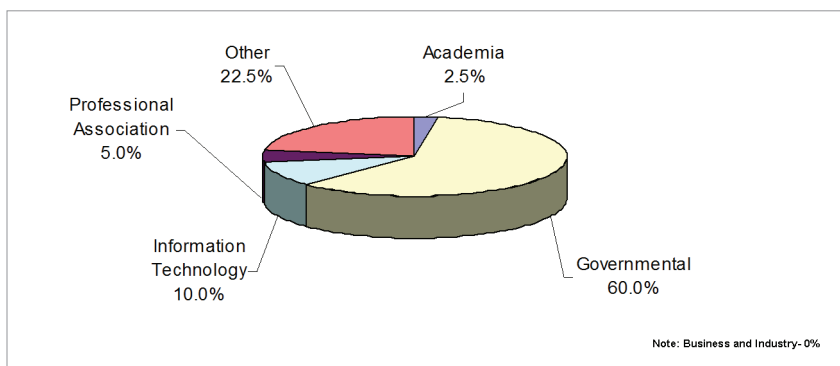
#### 6. Represented Jurisdiction Size



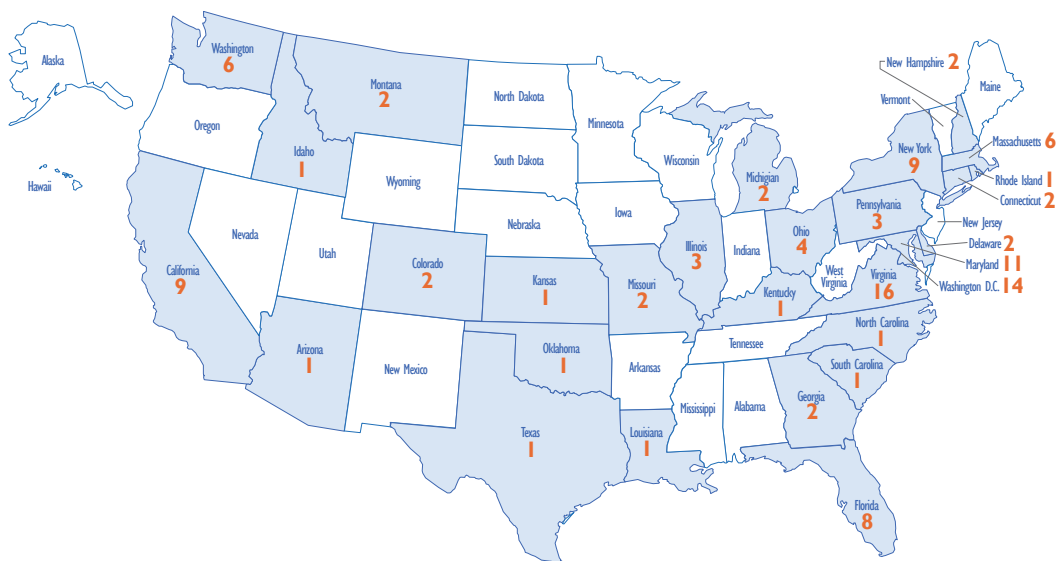
#### 7. Primary Responder Roles



### 8. Primary SME Roles



### 9. Membership including Federal Representatives



### 10. Membership not including Federal Representatives



## Purpose

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This document articulates the mission, vision, values, and strategic emphasis of the InterAgency Board (IAB). It serves as the basis for the IAB's ongoing strategic planning effort. This document is not static, but will evolve as the IAB's work progresses.

## Background

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The IAB is a voluntary collaborative panel of emergency preparedness and response practitioners from a wide array of professional disciplines that represent all levels of government and the voluntary sector. The IAB provides a structured forum for the exchange of ideas among operational, technical, and support organizations to improve national preparedness and promote interoperability and compatibility among local, state, and federal response communities. Based on direct field experience, IAB members advocate for and assist the development and implementation of performance criteria, standards, test protocols, and technical, operating, and training requirements for all-hazards incident response equipment with a special emphasis on Chemical, Biological, Radiological, Nuclear, and Explosive issues. The IAB also informs broader emergency preparedness and response policy, doctrine, and practice.

## Mission

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The mission of the InterAgency Board is to strengthen the nation's ability to prepare for and respond safely and effectively to emergencies, disasters, and CBRNE incidents. The IAB will accomplish this by:

- Emphasizing interoperability, compatibility, and standardization
- Fostering a multidisciplinary perspective
- Facilitating effective intergovernmental partnerships
- Being a credible voice of the responder community
- Being proactive
- Sharing field operational experiences and practices

## Vision

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The IAB seeks to be the source for emergency responder insight about any policy, doctrine, practice, standard, research and development program, or training and exercise program that affects interoperability, compatibility, and standardization. The IAB will continue to be a trusted, authoritative, representative, and valid repository of field perspective, operational knowledge, and technical expertise.

## Values

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The IAB purposely comprises a very diverse body of emergency preparedness and response experts, but is unified by a set of core values that frame its goals, shape its decisions, and guide its actions. These values are:

- **Ground truth.** The IAB is a conduit for direct feedback from responders currently practicing in the field on the front lines of emergency response at all levels of government. The IAB offers an honest, unfiltered, unvarnished view of what responders really do, what they really need, and how federal programs and policies affect them now and will affect them in the future.

- **Independence.** The IAB is an honest broker that aggregates the diverse views of responders. The Board as a whole is unencumbered by particular professional or agency agendas. The IAB's goals and objectives are set by consensus of its representative membership of the federal, state, and local emergency response communities. It is therefore broad in scope, and able to voice the perspectives, views, and concerns of responders nationwide without undue influence from the particular interests of any one discipline, organization, or professional association.
- **Credibility.** The IAB convenes established experts knowledgeable about emergency preparedness and response issues, particularly related to equipment, including requirements, standards, performance, operability, interoperability, and compatibility. This expertise assists, guides, and informs agencies, associations, and manufacturers seeking to design, develop, test, evaluate, and deploy existing and new equipment and capabilities. It helps organizations that sponsor research and development programs formulate grant guidance and evaluate program effectiveness. It helps response agencies make decisions about equipment by providing insight about performance, and operational, training, and maintenance requirements.
- **Diversity.** The IAB is broadly representative of professional response disciplines, sectors, and levels of government, explicitly shunning parochialism in favor of a true multidisciplinary perspective. The IAB is also wide-ranging in the size, type, and geographic location of organizations represented. This enables the diverse array of public safety professionals to come together as a unified and integrated emergency preparedness and response system.
- **Collaboration.** The IAB is a forum that brings diverse agencies and perspectives together. This enhances cooperation, reduces redundancy, resolves conflicts, and thus improves the safety, efficiency, and effectiveness of programs. The IAB is a nexus of disciplines and agencies that allows people to talk to each other and work together to solve problems. This culture of professional openness allows the group to develop viable solutions to equipment standardization and training challenges because all relevant players interact freely, honestly, and without fear of retribution.
- **Proactive orientation.** The IAB identifies local, national, and global trends that affect the response community, in order to understand the implications of policy and operational choices. This allows the IAB to help the field can adapt early to emerging trends, address looming threats, and take advantage of promising opportunities.

## Strategic emphasis

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In support of our mission and values, the IAB will pursue the following areas of emphasis:

### 1. *Equipment.*

- a. Continue to update and sustain the Standardized Equipment List (SEL).
- b. Support the Responder Knowledge Base (RKB).
- c. Identify gaps in capability.
- d. Participate in requirements development processes.
- e. Prioritize equipment needs.

### 2. *Science and Technology.*

- a. Identify innovative government- and industry-based technologies applicable for use by emergency responders.
- b. Promote the transition of technologies for use by emergency responders.
- c. Collaborate on requirements development processes.
- d. Promote research, development, testing, and evaluation (RDT&E) agendas to meet emergency responder needs.

### 3. *Standards Coordination.*

- a. Identify and document applicable standards, from internal (IAB) and external sources.
- b. Recommend potential solutions in terms of standards, equipment development, training, practices, or policies.
- c. Prioritize standards requirements, and related interoperability and compatibility issues.
- d. Identify existing standards, performance requirements, and test methods that could streamline the development of new standards or be modified to meet the needs of responders.
- e. Identify potential conflicting requirements and facilitate reconciliation of these issues.
- f. Participate in standards development and revision processes.
- g. Inform emergency responders about appropriate application of standards.
- h. Draft and disseminate studies, white papers, and other reports on standards, interoperability issues, and compatibility issues.
- i. Recommend and promote the adoption and use of standards.
- j. Identify and inform responders about relevant standards activities, comment periods, and programs that are addressing interoperability and compatibility issues.

### 4. *Best Practices.*

- a. Inform policymakers about operational requirements and environments.
- b. Provide insight about the field context, operations, and tactics of emergency response.
- c. Participate in forums working to develop or improve policy, doctrine, and practice.
- d. Help responders understand emerging policy, doctrine, and practice.
- e. Identify, share, and validate smart practices and lessons learned.
- f. Assist with vetting, testing, evaluating, and launching emergency response initiatives.

### 5. *Training and Exercises.*

- a. Identify performance improvement needs related to Emergency Support Functions.
- b. Provide subject matter expertise to support the development of training and exercise programs.
- c. Provide end-user guidance and operational lessons learned to support training and exercise program development and improvements.
- d. Facilitate the implementation of training and exercise programs and standards that support individual competencies and organizational capabilities.
- e. Advocate for standardized national guidance for responder and equipment training and exercises.

### 6. *Information Management and Communications.*

- a. Identify needs and gaps in the Responder Information Environment.
- b. Identify gaps in available information technology needed to support responders.
- c. Participate in efforts to identify gaps, improve systems and strategies for information management, including the gathering/collection, administration, sharing analysis/visualization, and protection of information.
- d. Identify gaps and challenges related to information collection, classification, storage, security and dissemination that effect incident prevention and emergency preparedness response.
- e. Educate emergency responders about the National Strategy for Information Sharing and how to collect, receive, and share essential elements of information.

- f. Identify gaps, and provide decision support material for interoperable communications technologies, policies and strategies

7. *Health, Medical, and Responder Safety.*

- a. Identify gaps and needs for providing safe and effective care.
- b. Evaluate the efficacy and appropriateness of existing and future health and safety related products, processes, practices, and information.
- c. Serve on working groups that address health and safety.
- d. Develop recommendations about how to identify control, reduce, or eliminate responder safety hazards, prevent injuries, and reduce mortality.
- e. Develop a medical concept of operations for planning, managing, and recovering from incidents that cause physical and/or physiological harm.
- f. Analyze threat scenarios and make recommendations about how to protect the health and safety of responders and victims.

The InterAgency Board is organized into Committees and SubGroups that are chaired by a first responder, supported by a Federal Co-Chair, and staffed with SMEs in that Committee's/SubGroup's area of interest. Each Committee/SubGroup is responsible for maintaining its subsection of the SEL. The Federal Agency Coordinating Committee is the exception as it is chaired by a Federal Chair and composed of supporting federal government representatives.

### ■ The InterAgency Board

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The IAB Chair and Vice Chair are selected from the ranks of the local and state membership. They administer, organize, and facilitate the actions of the IAB.

#### *State & Local Chair*

Robert J. Ingram, Center for Terrorism and Disaster Preparedness, FDNY

#### *State & Local Vice Chair*

Glenn P. Jirka, Miami Township (OH) Division of Fire and Emergency Management Service

### ■ Federal Agency Coordinating Committee

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

#### *Federal Chair*

Michael Walter, Department of Defense, Joint Program Executive Office for Chemical and Biological Defense

### ■ Standards Coordination Committee

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The SCC ensures that WMD response equipment and technology are integrated in the existing standards boards and regulatory bodies.

#### *Co-Chair*

Glenn P. Jirka, Miami Township (OH) Division of Fire and Emergency Medical Services

#### *Federal Co-Chair*

Kathy Higgins, Department of Homeland Security, Communications, Interoperability, & Compatibility Command, Control and Interoperability

### ■ Science and Technology Committee

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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*

Malcolm Trigg, Seminole County (FL) Fire Department

#### *Federal Co-Chair*

Gabriel Ramos, Technical Support Working Group (TSWG)



## ■ Compatibility and Interoperability Committee

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The Compatibility and Interoperability Committee (CIC) serves as the focal point for the coordination of interoperability and compatibility issues identified by the IAB. The CIC consolidates and prioritizes equipment, standards, training, and operational interoperability and compatibility concerns identified by the IAB SubGroups and Committees.

### *Co-Chair*

Robert J. Ingram, Center for Terrorism and Disaster Preparedness, FDNY

### *Federal Co-Chair*

Philip Mattson, Department of Homeland Security, Science and Technology Directorate, Office of Standards (formerly, National Institute of Standards and Technology, Office of Law Enforcement Standards)

## ■ Personal Protective and Operational Equipment SubGroup

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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*

William E. Haskell III, National Institute for Occupational Safety and Health (NIOSH), National Personal Protective Technology Laboratory (NPPTL)

## ■ Interoperable Communications and Information Systems SubGroup

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

### *Co-Chair*

Christopher Lombard, Seattle (WA) Fire Department

### *Federal Co-Chair*

Mike Tuominen, National Interagency Fire Center

## ■ Detection and Decontamination SubGroup

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

### *Co-Chair*

Thomas Brandon, Suffolk County (NY) Police Department

### *Federal Co-Chair*

Elaine Stewart-Craig, Department of Defense, Research, Development and Engineering Command (RDECOM), Edgewood Chemical and Biological Center (ECBC)

## ■ Medical SubGroup

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

### *Co-Chair*

Thomas Walsh, Mount Erie (WA) Fire Department

### *Federal Co-Chair*

Stephen Skowronski, Centers for Disease Control and Prevention (CDC)

## ■ Training SubGroup

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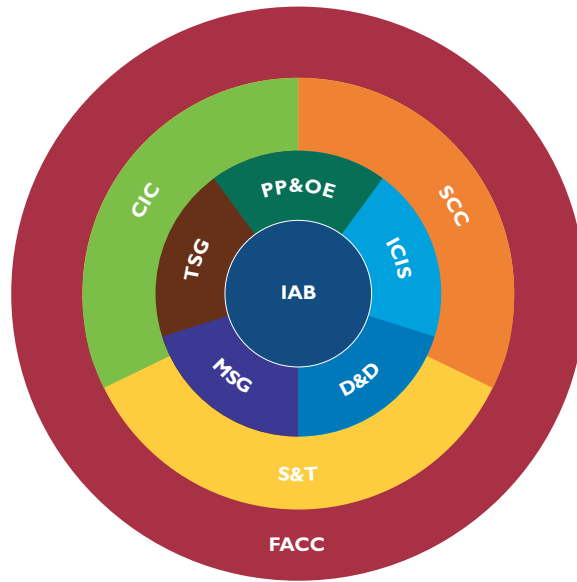
The TSG aims to improve responder mission performance through review of and input to training, doctrine, and guidance.





### *Co-Chair*

Alan "AD" Dennis Vickery, Seattle (WA) Fire Department

### *Federal Co-Chair*

Teresa Embrey, Technical Support Working Group



-  The InterAgency Board (IAB)
-  Federal Agency Coordinating Committee (FACC)
-  Standards Coordination Committee (SCC)
-  Science & Technology (S&T) Committee
-  Compatibility & Interoperability Committee (CIC)
-  Personal Protective & Operational Equipment (PP&OE) SubGroup
-  Interoperable Communications & Information Systems (ICIS) SubGroup
-  Detection & Decontamination (D&D) SubGroup
-  Medical SubGroup (MSG)
-  Training SubGroup (TSG)

# Federal Agency Coordinating *Committee (FACC)*

## CHAIR

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**Michael Walter, Ph.D.**

*Department of Defense, Joint Program Executive Office for  
Chemical and Biological Defense*

## Membership

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**Bert Coursey**

*Department of Homeland Security, Science and Technology Directorate*

**Donald Grant**

*Department of Homeland Security, Federal Emergency Management  
Agency, National Preparedness Directorate*

**William Haskell**

*National Institute for Occupational Safety and Health, National  
Personal Protective Technology Laboratory*

**Kathleen Higgins**

*Department of Homeland Security, Science and Technology  
Directorate, Command, Control and Interoperability Division*

**Philip Mattson**

*Department of Homeland Security, Science and Technology  
Directorate, Office of Standards (formerly, National Institute of  
Standards and Technology, Office of Law Enforcement Standards)*



**The Federal Agency Coordinating Committee provides the interface between the IAB Chair, Vice Chair, and the sponsoring federal government agencies. It coordinates the interests and initiatives of the federal community with the first responder community.**

## Membership

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The FACC includes the U.S. Department of Defense; the U.S. Department of Homeland Security, which includes the Federal Emergency Management Agency (FEMA), the U.S. Customs and Border Protection, and the Science and Technology Directorate; National Institute for Occupational Safety and Health/National Personal Protective Technology Laboratory; and the National Institute of Standards and Technology/Office of Law Enforcement Standards. Each of the federal partners is briefly described below.

### Department of Defense, Chemical and Biological Defense Program

The Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Programs leads the DOD Chemical and Biological Defense Program (CBDP). Acquisition and advanced development of chemical and biological defense–related materiel is the responsibility of the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD). The Special Assistant to the Secretary of Defense (Chemical and Biological Defense) assists in the oversight of this program. The CBDP is a key part of a comprehensive national strategy to counter the threat of chemical and biological (CB) weapons as outlined in *The National Strategy to Combat Weapons of Mass Destruction*, December 2006.

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

As one of IAB's founding organizations, DOD continues to support its facets and areas. DOD personnel serve on the FACC, participate in the development the overall IAB strategy, and hold memberships in all IAB SubGroups and Committees.

### **Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Directorate**

The 2006 Post-Katrina Emergency Management Reform Act mandated the creation of the National Preparedness Directorate (NPD), unifying DHS' preparedness, mitigation, response, and recovery missions. It includes divisions from the former DHS Preparedness Directorate, e.g., the Office of Grants and Training, the National Exercise Program, and the National Preparedness Task Force.

Established on April 1, 2007, NPD oversees the coordination and development of the capabilities and tools necessary to prepare for terrorist incidents and natural disasters. NPD provides strategy, policy, and planning guidance to build prevention, protection, response, and recovery capabilities among all levels of government throughout the nation. NPD programs leverage training courses, exercises, and technical assistance to ensure homeland security capabilities are standardized and incorporated within a common framework. As part of FEMA, NPD closely coordinates with other FEMA offices and directorates, agencies, and departments to produce a unified approach to emergency management.

### **Department of Homeland Security, Science and Technology Directorate**

The DHS S&T Directorate serves as the primary R&D arm of homeland security. Its mission is to improve homeland security by providing its customers—the operating components of DHS and state, local, tribal, and territorial emergency responders and officials—state-of-the-art technology that helps them accomplish their missions. DHS S&T manages an integrated program of S&T, from basic research to product transition, guided by a risk-diverse, multitiered invested strategy based primarily on the stated needs of customers balanced with emerging technology opportunities. The Standards Office, within the Test & Evaluation/Standards Division of 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 the majority of the funds that support the standards development requirements identified by the IAB.

### **Department of Homeland Security, Science and Technology Directorate, Command, Control and Interoperability Division**

The Command, Control and Interoperability Division (CID) is working to ensure that stakeholders have comprehensive, real-time, and relevant information to create and maintain a secure and safe nation. With its federal partners, the division strives to strengthen communications interoperability, improve Internet security and integrity, and accelerate the development of automated capabilities to help identify potential national threats. CID customers include local, tribal, state, and federal emergency response agencies; federal agencies that plan for, detect, and respond to all hazards; and private-sector partners that own, operate, and maintain the nation's cyber infrastructure. Managed by DHS S&T, CID delivers on its efforts through five thrust areas: basic/futures research; communications, interoperability, and compatibility; cyber security; knowledge management tools; and reconnaissance, surveillance, and investigative technologies.

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

NIST is America's premier national laboratory for metrology and standards. An agency of the U.S. Department of Commerce, NIST was charged at its founding in 1901 with advancing measurement science, standards, and technology in support of U.S. industry and the country's economic security and quality of life. As technology progressed, NIST's capabilities expanded into world-class expertise in chemistry, physics, manufacturing, materials engineering, building and fire research, optics, electronics, and electrical engineering. Today, NIST is recognized worldwide as a leader in many areas of science and technology and boasts a history that includes three Nobel Prize laureates.

Beginning with the Great Baltimore fire in 1904 and the rise of forensic sciences in the 1910s, government agencies concerned with public safety and security turned to NIST for technical assistance. For decades, these cooperative efforts were informal. In 1971, in response to a congressional mandate, NIST created OLES to partner with the U.S. Department of Justice and other agencies in establishing minimum performance standards for critical law enforcement equipment, such as body armor, handcuffs, metal detectors, and mobile radios. Here, too, NIST's capabilities quickly expanded to include technologies used by the fire service, corrections and security personnel, and forensic investigators.

OLES was invited to join the IAB Standards Coordination Committee in 1999. In 2000, the office was named executive agent of the standards development effort and quickly organized a coalition of government agencies and professional associations that has been extraordinarily effective in developing performance standards related to CBRNE detection, decontamination, and personal protection technologies and in issuing publications that help agencies select, maintain, and properly use this equipment. The performance standards developed by the coalition have been adopted by DHS as a basis for equipment procurement at all levels, and a multiyear plan is in place to continue this important work.

### **National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory**

NIOSH conducts a range of efforts in the areas of research, guidance, information, and service. The NIOSH program portfolio focuses on relevance, quality, and impact, achieved through strong involvement of partners and stakeholders through the entire research continuum (conceiving, planning, conducting, translating, disseminating, and evaluating). The programmatic and support structures provide a foundation for staff to carry out its mission to maintain national and world leadership to prevent work-related illnesses and injuries.

The NIOSH program portfolio is organized into eight sectors representing industrial sectors and 24 cross-sector programs around adverse health outcomes, statutory programs, and global efforts. The mission of the Personal Protective Technology (PPT) cross-sector is to prevent work-related illness and injury by advancing the state of knowledge and application of PPTs. PPT includes the technical methods, processes, techniques, tools, and materials that support the development and use of personal protective equipment (PPE) worn by individuals to reduce effects of their exposure to a hazard.

NPPTL was established by NIOSH in 2001 when Congress underscored the need for improved PPE and encouraged research for PPTs. NPPTL leadership serves as the Program Manager for the NIOSH PPT Cross-Sector Program. NPPTL is organized into three branches:

- ***The Technology Evaluation Branch*** performs testing, evaluation, and quality assurance checks. More than 8500 approvals have been issued to approximately 88 approval holders at more than 100 manufacturing sites in 18 countries. There are 88 approvals for various CBRN respirators, including 24 models of CBRN SCBA respirators from four manufacturers to NFPA 1981, 2007 ed. The objective of the respirator certification program is to ensure that workers have access to respiratory protection that meets appropriate standards. Products are evaluated for compliance with applicable provisions of standards before manufacturers are permitted to label the respirator as NIOSH approved. The quality program conducts periodic audits of respirator performance and investigates reported problems with deployed units to ensure continued compliance of previously approved respirators.
- ***The Technology Research Branch*** conducts research in four areas related to respiratory protection, sensors for PPTs, human performance, and PPE ensembles, including ensembles for first responders that provide improved protection against CB agents. This research supports the development of new test methods and innovative technology for improved PPE and performance assessment of PPE against emerging hazards such as nanoparticulates and pandemic influenza. Some of the group's projects include a facial anthropometrics program to establish respirator fit test panels,



develop test headforms and respirator sizing systems, and understand the facial characteristics that affect respirator fit. In addition, the branch is working on further developing and applying mathematical models and chemical microsensors to help estimate end-of-service-life and determine optimal change-out schedules for respirator cartridges. Human physiology and ergonomic studies are conducted to assess the burden imposed by respirators and protective clothing ensembles and to develop countermeasures to that burden. Researchers are developing innovative methodology for evaluating overall integrity of protective ensembles against aerosol hazards. Other research involves new test methods for chemical-protective clothing.

- *The Policy and Standards Development Branch* develops and updates standards to ensure the safety and health of respirator users, including respirator standards for protection against CBRN hazards. This group is working on a quality assurance module that will align the 42 CFR Part 84 standards with contemporary quality assurance practices and procedures. Criteria for total inward leakage are being established as a requirement for the certification of respirators. This branch also develops guidance documents to assist first responders in the selection and use of respirators and protective ensembles designed to protect against CBRN hazards.

The NIOSH PPT Program/NPPTL was critically reviewed by an evaluation committee convened by the Institute of Medicine and the National Research Council. The committee assessed the program based on the relevance of the efforts to improve worker health and safety and the impact of the work to improvements in occupational health and safety. The committee assigned a score of 4 (with 5 being the highest score) for both impact and relevance. The committee noted that the program has made probable contributions to end outcomes and has achieved well-accepted intermediate outcomes. Regarding relevance, the committee further noted the PPT Program/NPPTL is focusing on priority areas and is engaged in transferring its research into practice. The PPT Program reviewed the report and developed an action plan to address its recommendations. The PPT Program Action Plan achieves an effective balance between intramural and extramural program enhancement and expansion over a five-year time frame. The plan is scheduled for presentation to the NIOSH Board of Scientific Counselors in Spring 2009.

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

## Role and Functions

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The FACC provides the funding for IAB operations. 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 FACC. The FACC Chair is elected on an annual basis. With unanimous agreement among the federal partners, DOD, JPEO-CBD served as the FACC Chair of the IAB in 2008.

The FACC leverages ongoing federal RDT&E efforts to meet the responder requirements as identified by the IAB. The Chair and Vice Chair of the IAB and the FACC work together to prioritize initiatives within the IAB and the federal community. The FACC 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 2008

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- SEL published in Annual Report and CD-ROM. A searchable, interactive version is also available on the IAB website. Electronic copies are also available on the RKB.
- Continued coordination with the RKB staff in aligning content and taxonomy of the AEL with the SEL on the RKB.
- Produced the Interoperability and Compatibility Priority List through the CIC.
- Continued IAB visibility through conference participation, panel and speaking engagements, and booth presence at conferences such as the Technologies for Critical Incident Preparedness Conference.
- Developed a SharePoint site (to replace WEBEXONE) for IAB members to share documents, internal communication, calendars, meeting materials, presentations, IAB data, and SubGroup/Committee projects. The SharePoint site will serve as data repository for IAB members updated regularly by the IAB Program Office.
- SharePoint site was updated with all previous and current Priority Lists, including Standards, Science and Technology, and Compatibility and Interoperability. The lists are updated and managed through the site by the Program Office.
- Continued management of the Strategic Planning Committee for short-/long-term planning and reorganization that will take place in 2009.
- Managed over 25 IAB meetings, work sessions, or related meetings with IAB member participation.
- Provided multiple federal agencies funding for continued IAB operation.

The FACC continues to work with the SCC to address the IAB's lists of priorities, particularly with the development of CBRNE equipment standards, and to coordinate this development with other public and private standards development organizations, both within and outside the federal government. The FACC reviews and approves the IAB's annual operating budget and maintains a support staff to facilitate operations. The FACC meets with the IAB Chair and Vice Chair on a regular basis to review SubGroup/Committee recommendations and action items.



**Michael Walter, Ph.D.**

*Department of Defense, Joint Program Executive Office for Chemical and Biological Defense*

Dr. Mike Walter is the JPEO-CBD Senior Staff Scientist. He has 22 years of research experience in environmental microbiology and CB defense. Dr. Walter joined JPEO-CBD in 2004. As Chief of Science and Special Projects within the Future Acquisition Directorate, he has:

- established the first and only quality assurance program monitoring efficiency of bio surveillance programs for multiple federal agencies
- managed multiple inter- and intraagency special projects, including
  - Program Manager of the Military Mail Screening Program
  - Program Manager of the Sampling Method Validation Testing and Evaluations
  - Technical Director of Joint Service Installation Pilot Program
  - Technical Director of various Technology Readiness Evaluations and Assessments
- designed, deployed, and managed operations of Guardian Regional Laboratory

Prior to joining JPEO-CBD, Dr. Walter worked as a scientist at Naval Surface Warfare, where he managed multiple R&D programs and served as technical director for the Joint Biological Remote Early Warning System program.

Within his career, Dr. Walter has additionally worked for other federal agencies, including the Central Intelligence Agency as a Center Operations Manager and Program Manager for Biological Technology and the Environmental Protection Agency studying potential adverse effects associated with the release of genetically modified organisms. His corporate experience includes working in bioremediation for Texaco.

Dr. Walter received a B.A. in biology from Northland College in Ashland, Wisconsin in 1978. He also holds an M.A. in biology from Saint Cloud State University and a Ph.D. in microbiology from the University of North Dakota. Dr. Walter is Level III Acquisition Certified and a member of the American Society for Microbiology. Throughout his career, Dr. Walter has received numerous technical and scientific awards and published numerous articles.



# Standards Coordination Committee (SCC)

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## CO-CHAIR

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

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## FEDERAL CO-CHAIR

**Kathleen Higgins**  
*Department of Homeland Security, Science and Technology Directorate, Command, Control and Interoperability Division*

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## Membership

**Roberta Breden**  
*Department of Homeland Security, Federal Emergency Management Agency, Technology Support Branch*

**Les Boord**  
*National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory*

**Thomas Brandon**  
*Suffolk County (NY) Police Department*

**Teresa Embrey**  
*Technical Support Working Group*

**Stephen Graham**  
*United States Army Center for Health Promotion and Preventive Medicine*

**William Haskell**  
*National Institute for Occupational Safety and Health, National Personal Protective Technology Laboratory*

**Robert Ingram**  
*Fire Department, City of New York (NY)*

**Robert Johns**  
*Department of Homeland Security, Domestic Nuclear Detection Office*

**Christopher Lombard**  
*Seattle (WA) Fire Department*

**Philip Mattson**  
*Department of Homeland Security, Science and Technology Directorate, Office of Standards (formerly, National Institute of Standards and Technology, Office of Law Enforcement Standards)*

**Gabriel Ramos**  
*Technical Support Working Group*

**Stephen Skowronski**  
*Centers for Disease Control and Prevention*

**Elaine Stewart-Craig**  
*Department of Defense, Research, Development, and Engineering Command, Edgewood Chemical and Biological Center*

**Debra Stoe**  
*National Institute of Justice*

**Malcolm Trigg**  
*Seminole County (FL) Fire Department*

**Mike Tuominen**  
*National Interagency Fire Center*

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

**Thomas Walsh**  
*Mount Erie (WA) Fire Department*

**Mike Walter**  
*Department of Defense, Joint Program Executive Office for Chemical and Biological Defense*

**Douglas Wolfe**  
*Sarasota County (FL) Fire Department*

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## Subject Matter Experts

**Timothy Brooke**  
*American Society for Testing and Materials International*

**Don Hewitt**  
*Proconsul, Inc.*

**Jeffrey Stull**  
*International Personnel Protection*

**Bruce Teele**  
*National Fire Protection Association*

**The mission of the SCC is to coordinate standards projects within the IAB, with external organizations, and with the first responder community. The objective is to promote local, state, and federal preparedness for responding to all-hazards incidents, especially those involving CBRNE issues. Additionally, by focusing the nation's resources and expertise in a common effort to establish minimum performance standards to which critical equipment can be tested, certified, and evaluated, the SCC helps to provide first responders with objective guidance for making informed decisions regarding the purchase and proper use of that equipment. As a result, both first responders and the citizens they serve can have greater confidence in the technologies upon which their lives depend.**

## Membership

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The SCC includes representatives from federal and private standards-development organizations, as well as the co-chairs of the IAB SubGroups and Committees. NIST/OLES serves as the SCC's executive agent and is charged with administering, maintaining, and promulgating the CBRNE standards identified for development or adopted by the IAB.

## Roles and Functions

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The SCC supports and coordinates the SubGroups' efforts to identify and meet standards requirements within the first responder community. Specifically, the SubGroups identify existing standards that must be modified and areas in which new standards must be developed, and the SCC assists with the following:

- Identifying gaps in the existing body of applicable standards
- Prioritizing standards projects based on first responder needs as identified by IAB SubGroups and Committees
- Advocating for appropriate minimum performance, reliability, and quality requirements into existing standards being modified or updated by regulatory, consensus, and/or voluntary standards organizations
- Facilitating development of new standards by regulatory, consensus, and/or voluntary standards organizations
- Recommending standards for adoption by the IAB and promoting the adoption and use of those standards

The SCC also tracks and reviews the progress of standards projects and serves as a feedback loop to the SubGroups and Committees by the following:

- Alerting SubGroups and Committees when conflicting requirements are proposed and facilitating reconciliation of these issues

- Notifying SubGroups and Committees when proposed requirements contradict federal or state regulations
- Identifying existing standards, performance requirements, and test methods that could streamline the development of new standards or be modified to meet IAB needs
- Alerting SubGroups and Committees to similar or complementary development efforts under way within regulatory, consensus, and/or voluntary standards organizations
- Providing advice for improving performance requirements
- Informing the IAB about open comment periods for standards that have application to the responder community

## Partnerships

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The success of the IAB's standards efforts relies on its partnerships with regulatory agencies and standards-development organizations. For example, with regard to equipment, the SCC serves as the IAB's liaison to these partners in matters relating to performance requirements; test methods; certification requirements; and selection, use, and care guides. The SCC has also initiated working relationships with many federal, nonprofit, and private standards agencies, including the following:

- ANSI
- IAFF
- IACP
- ASTM International
- DHS
- DOD
- DOE
- ECBC
- EPA
- NFPA
- NIJ
- NIOSH NPPTL
- NIST/OLES
- OSHA

## IAB-Adopted and -Referenced Standards and Priorities

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The SCC establishes and maintains an updated list that identifies standards that have application to an all-hazards response. In addition, the SCC Committee supports and coordinates the IAB's efforts to identify and prioritize standards requirements within the first responder community.

To do so, the Committee conducts a rigorous survey of the IAB. After the respective gaps are identified across all IAB SubGroups and Committees, the gaps are then evaluated using a standardized survey questionnaire. The survey responses are statistically analyzed, and a rank order is established for each gap selected for the evaluation. The end products of the survey is a list of priorities, vetted by the IAB membership: the IAB Standards Development Priorities.

The priority list below is shared with the standards community to help focus standards development agendas:

### *Tier 1*

- Dermal Exposure Standards for Toxic Industrial Chemicals (TICs)
- Law Enforcement PPE Standards
- Portable Explosives Detectors
- All-Hazard Core Competencies for Responders
- Handheld Detectors for TICs
- Combination Powered Air-Purifying Respirator (PAPR)/Self-Contained Breathing Apparatus (SCBA)



*Tier 2*

- Instructor Qualification Standards
- Field Assays for Biological Agents
- Computer-Aided Dispatch (CAD) Interface Standard
- Respiratory Protective Devices for Infectious Diseases
- Decontamination Showers
- CBRN PAPR Standard for Moderate- and High-Flow-Rate Operations

*Tier 3*

- Uniform Public Health Surveillance Standard
- Urge Adoption of OSHA 7600 – Disaster Site Worker
- Medical Credentialing During Emergency Response
- Mass Decontamination Systems
- Training Academy Accreditation
- Required Elements for Equipment Training Package

*Tier 4*

- Modeling and Simulation
- Support Development of NFPA 1952 (Water and Swift-Water)
- Extraction Litters
- PPE for Underwater Operations
- Portable Medical Equipment Power

The Standards List located at the end of the SEL includes standards officially adopted by the IAB and additional standards that SEL users will find valuable for reference. The standards most recently adopted by the IAB are as follows:

- NFPA 1977
- NFPA 471 (removed)
- NIJ Standard 0101.06, Ballistic Resistance of Body Armor, July 2008
- Emergency Data Exchange Language Resource Messaging (EDXL-RM) 1.0, OASIS, November 2008
- Emergency Data Exchange Language (EDXL) Hospital Availability Exchange (HAVE) 1.0, OASIS, November 2008
- Emergency Data Exchange Language (EDXL) Distribution Element, OASIS, May 2006
- Common Alerting Protocol (CAP) 1.1, OASIS, October 2005

## Accomplishments

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During the past year, the IAB has successfully influenced the development of priorities for standards, as well as the revision of several CBRN and all-hazards related standards, specifically the following:

- Reviewed and reaffirmed the IAB Standards Development Priority List.

- SCC members continued to serve as the IAB's liaison on the joint AOAC/ANSI/ASTM working groups responsible for the revision of several relevant explosive and sampling standards.
- SCC members continued to serve as the IAB's liaison to the NFPA protective clothing and equipment Technical Correlating Committee and the NFPA Hazardous Materials Protective Clothing and Equipment Committee.
- Continued to promote the DHS program requirement that funds are used specifically for the purchase of CBRNE equipment that meets DHS-established or -adopted performance standards.
- Participated in two NIJ standards development activities—the NIJ CBRN Protective Ensemble Standard for Law Enforcement and the NIJ Bomb Suit Standard.

## Current Initiatives

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The following are among the equipment performance standards activities to which the SCC is currently contributing:

- Revision of ASTM Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders
- Revision of ASTM Chemical Weapons Detection and equipment certification standard
- Continued NIOSH, ECBC, and NIST development of standards and test procedures for all classes of CBRN respirators, including CBRN combination SCBAs, CBRN supplied-air respirators, and closed-circuit SCBAs
- Continued support of standards development activities in ASTM for urban search and rescue robots and blast-resistant trash receptacles



**Glenn P. Jirka**

*Deputy Chief of Operations  
Miami Township (OH) Division of Fire and Emergency  
Medical Services*

Chief Jirka began his career as a firefighter with the Savoy (IL) Fire Department while working on his postgraduate studies in analytical chemistry at the University of Illinois. During his career, Jirka served as a Field Instructor for the University of Illinois Fire Service Institute and a Program Manager for the University of Missouri Fire Service Institute, held an appointment as Adjunct Assistant Professor of Nuclear Engineering at the University of Missouri, and served as a member of Search and Rescue Team Missouri Task Force One Urban, including a deployment to the World Trade Center disaster on September 11, 2001. Chief Jirka is the author of several journal articles and book chapters; a member of the Advance Rescue Technology Editorial Board; and a member of several professional organizations, including the NFPA Hazardous Materials Protective Clothing and Equipment Technical Committee (Chair), NFPA Fire and Emergency Services Protective Clothing and Equipment Technical Correlating Committee, International Association of Fire Chiefs, Ohio Fire Chiefs Association, International Fire Service Training Association Hazardous Materials Committee, and the Ohio Department of Homeland Security Hazardous Materials Technical Advisory Committee. Jirka was recently recognized by the Greater Montgomery County Fire Chiefs as the 2005 Fire Fighter of the Year.



**Kathleen M. Higgins**

*Director, Office for Interoperability and Compatibility,  
Command, Control & Interoperability Division, Science  
and Technology Directorate, Director for Homeland Security*

Kathleen Higgins began her career as a forensic chemist, serving in the public sector, cofounding a private forensic laboratory, and working in forensic science education. After managing materials development programs for the U.S. Postal Service Engineering and Development Center for several years, she was appointed Director of the Office of Law Enforcement Standards at NIST. Under her leadership, the office grew from a handful of programs with a budget of \$1 million to more than 50 active projects with a budget near \$60 million. In 2001 the Department of Commerce awarded Ms. Higgins its Silver Medal for Outstanding Achievement, and George Washington University honored her in 2002 for extraordinary service to the federal government and the nation. In November 2003, she was appointed Assistant to the Director for Homeland Security at NIST. In November 2007, Ms. Higgins accepted a position in DHS' Science & Technology Directorate as Director, Office for Interoperability and Compatibility, Command, Control & Interoperability Division. Ms. Higgins is a member of several professional organizations, including the ASTM E54 Committee on Homeland Security Applications (Chair) and the International Association of Chiefs of Police (Homeland Security Committee). Ms. Higgins also serves as the head of the U.S. delegation to the International Organization for Standardization's Strategic Advisory Group on Security.

# Science & Technology (S&T) Committee

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## CO-CHAIR

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*Seminole County (FL) Fire Department*

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## FEDERAL CO-CHAIR

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

### Roles and Functions

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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, provide an annual demographics report of the IAB membership, and assess innovative government- and industry-developed technologies. The IAB S&T Requirements Matrix (following this section) identifies future technology needs for detection, individual protection, collective protection, medical support, decontamination, communications systems, information technology, and operational equipment.

### Initiatives and Progress

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During 2008, 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.
- Implemented a new web-based survey to prioritize R&D requirements from SubGroups.
- Conducted a statistical analysis of the IAB R&D requirements survey results and delivered a Prioritized R&D Requirements List (PRL) for official publication.
- Reviewed the 2008 SEL Categories and updated the Summary of Current R&D Projects Matrix (also known as the S&T Matrix).
- Coordinated input into federal research and development agencies to leverage IAB-prioritized requirements.
- Designed and implemented a new web-based survey to gather IAB membership demographics data.
- Completed the demographic information survey of the IAB membership to assist in describing the interagency composition, skill sets, and representation in the IAB.
- Attended the 3rd Annual Environmental Sampling Conference.

- Participated in the Homeland Security, Presidential Directive (HSPD)-22 (Action 29B) Chemical Detection Architecture working group and provided technical input.
- Attended and presented technical briefings at the Technologies for Critical Incident Preparedness Conference.

## Ongoing Initiatives in 2009

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The S&T Committee has established a formal process to collect and prioritize IAB R&D requirements. This work will continue in 2009 and will involve a new requirements collection survey from all IAB SubGroups, followed by statistical analysis and prioritization based on results of the survey.

In 2009 the S&T Committee will invite industry representatives and federal R&D laboratories/centers to deliver focused S&T briefings to the committee, prepare an “S&T Technical Bulletin” of new and emerging technologies that will be published by the S&T Committee on a quarterly basis, and coordinate visits to industry R&D facilities and federal R&D laboratories/centers.

The S&T Committee will continue work to support a demographic database and analysis of the IAB membership. New demographic data will be gathered in 2009.

As federal agencies programs address prioritized IAB R&D requirements, the S&T Matrix will be updated to reflect the project name, managing agency/participants, and status of availability. The addition of a “Technology Readiness Level (TRL)” column to the S&T Matrix will be examined.

Work will continue to integrate the S&T Matrix as a content area of the Responder Knowledge Base allowing the information to be cross-referenced to SEL categories.

## Identified Requirements

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The following prioritized R&D requirements were identified by the SubGroups in 2008 as capability gaps that should receive special consideration by R&D initiatives:

### IAB Prioritized Capability Gaps for 2008

1. 3-D Tracking of Personnel\*
2. Hands-Free Radio Intercom\*
3. Handheld Standoff Chemical Identifier
4. CAD-to-CAD Interface
5. Personal Wireless Network Incorporating Multiple Items
6. Noise-Filtering Digital Speaker/Microphone for SCBA\*
7. Personal Bluetooth (like) Radio Interface
8. Improved Explosive Detection Capability\*
9. Single Detector for Chemical Warfare Agents (CWAs) and TICs\*
10. Multi-Agent Biological Detection Field Assays
11. Respiratory Protection for Wildland Firefighting
12. Bomb Suit/SCBA Facepiece Compatibilities
13. Rapid System(s) to Decontaminate Ambulance Interiors
14. Incident Management Training and Qualification System

15. Device for Standoff Casualty Triage\*
16. Research Feasibility and Develop Guidelines for Use of Air-Purifying Respirators during Late-Stage Investigative Operations in Non-IDLH [immediately dangerous to life or health] Environments\*
17. Improved Mass Decontamination Systems\*
18. Modeling/Simulations Standard
19. Equipment/Supply Guide for Relocating Special Needs Victims
20. Emergency Escape for SCBA Attachments
21. Vehicle and Aircraft Conversion Guide\*
22. Gaming Standard
23. Simulation Evaluation Criteria
24. Enhanced Decontamination Capability for Special Needs Victims

\* Continuing R&D requirements from 2007.



**The Science and Technology (S&T) Committee submits the following overview of test methods and standards for PPE in 2008.**

**Improved Test Methods and Standards for First Responder PPE:  
Recent Advances from NIOSH**

Ron Shaffer, Angie Shepherd, and William Haskell  
National Institute for Occupational Safety and Health (NIOSH)  
National Personal Protective Technology Laboratory (NPPTL)

**Introduction**

Everyday, emergency responders—firefighters, law enforcement officers, emergency medical personnel, and special operations teams—are actively involved in protecting people and property. In performing their jobs, public safety and emergency personnel face a wide range of hazards that can result in serious injury, chronic health problems, and loss of life. Exposures to these hazards are mitigated by the use of personal protective equipment (PPE), such as protective clothing/ensembles and respirators. In spite of the significant advances made in the last decade in PPE for emergency responders, there remain shortfalls in levels of comfort, protection, and performance.

Since 1972, the National Institute for Occupational Safety and Health (NIOSH) has conducted an internationally recognized respirator certification program. In 2001, NIOSH established the National Personal Protective Technology Laboratory (NPPTL) to prevent work-related injury, illness, and death by advancing the state of knowledge and application of PPE and related technologies. The scope of the NIOSH program today encompasses diverse activities involving multiple types of PPE to provide personal protection against inhalation, dermal, and injury hazards.[1] In addition to respirator certification, NPPTL has an active research and development program focused on the development of new test methods, understanding the performance of PPE against known and emerging hazards, and the creation of new technologies for reducing the barriers to effective use of PPE. Translation of the information generated from these research projects into consensus standards is an essential activity.

A key element of the NPPTL strategy for technology transfer (research to practice) involves active participation with the IAB. The IAB provides a unique opportunity for NPPTL managers, scientists, and engineers to meet with leaders in the local, state, and federal responder community to discuss and then address PPE issues of importance to the community. Involvement with the IAB also provides opportunities for interactions with other government agencies involved in PPE research such as the Technical Support Working Group (TSWG), National Institute for Standards and Technology (NIST), Department of Homeland Security (DHS), and the Department of Defense (DOD) to improve the coordination of government research efforts. For example, NPPTL uses information from the IAB Science and Technology (S&T) committee such as the “Summary of Current Research and Development by SEL Category” table from the annual report to learn about activities at other agencies and the “Prioritized Capability Gaps” to justify continued support for existing programs and to develop future research activities. Information from the IAB Compatibility and Interoperability Committee (CIC) and the Personal Protective and Operational Equipment (PP&OE) SubGroup are also used to plan and execute research projects to address their identified PPE performance requirements.

This report will highlight two recent “success stories” from NPPTL where laboratory research on protective clothing and equipment was successfully transitioned to consensus standards. The roles that the IAB played in the development or transition of the project will also be highlighted.

**Improved Criteria for Emergency Medical Services Protective Clothing**

Over 1 million firefighters and an additional 500,000 Emergency Medical Technicians and other first responders are estimated to be engaged in emergency medical service (EMS) operations. These

EMS responders routinely are exposed to a wide range of hazards, including blood-borne pathogens that require the use of PPE. Medical aid calls also involve physical hazards, particularly in the extrication of victims from vehicle accidents, building collapses, and other disasters. There are concerns for exposures to contaminated victims and hazardous substances during responses to incidents that may involve chemical, biological, radiological, and nuclear (CBRN) threats.

The National Fire Protection Association (NFPA) establishes performance and design requirements for PPE used by EMS personnel.[2] NFPA 1999 Standard on Protective Clothing for Emergency Medical Operations sets criteria that apply to garments, eye/face protection devices, examination gloves, cleaning gloves, work gloves, footwear, and footwear covers. While the standard has been well received within the EMS industry for some product areas (primarily reusable garments and examination gloves), there have been no certifications of cleaning gloves or single-use protective garments to the 2003 edition of the standard. In addition, there has been relatively little industry response to eye/face protection devices, work gloves, and footwear. Feedback from industry has indicated that some of the criteria did not match the types of products that first responders typically use or need. It was also discovered that certain criteria in the 2003 edition were competing criteria and prevented the certification of products.

The IAB recognized and publicized the need for improved standards for EMS responders. For example, the 2002 Annual Report contained a list of initiatives for the PP&OE SubGroup which included the need to develop PPE performance criteria for emergency medical operations and hospital medical personnel. In 2005, the Occupational Safety and Health Administration (OSHA) released the “OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances.” The need for more definitive PPE performance requirements and standards for the medical community was highlighted as a result of these discussions within the PP&OE SubGroup. In 2006, the CIC published a resulting list of issues which included the need for guidance on EMS equipment and dexterity issues for gloves during medical triage.

NPPTL commenced a research project in 2005 to address the initiatives of the IAB in this area and to address the limitations in the previous edition of the NFPA 1999 standard. In this project, NPPTL researchers, along with external partners, executed a series of investigations to provide the basis for recommending specific, mission-based criteria for the protection of responders during emergency medical operations. These investigations included assessment of the hazards faced by EMS responders, discussions with EMS responders to learn about their PPE needs, and evaluation of available PPE to determine appropriate technical performance levels. Currently available PPE was evaluated through extensive laboratory benchmark testing and user wear assessment to determine appropriate state-of-the-art design requirements and performance levels.

The recommended criteria and test methods were incorporated by NFPA into the 2008 edition of the standard. As a consequence of this research program, the revised NFPA 1999 standard permits the certification of additional types of protective clothing that will more closely fit the needs and requirements of first responders during emergency medical operations. New and revised requirements now permit the certification of single-use and multiple-use garments; examination, cleaning/utility and work gloves; single-use facemasks, single-use and multiple-use eye and face protection devices; single-use footwear covers; multiple-use emergency medical footwear; multiple-use medical care facility footwear; multiple-use helmets; and multiple-use [C]BRN ensembles. The NFPA 1999, 2008 edition also includes a requirement for flammability resistance and optional criteria for visibility assessment. A detailed final report for the project is available from NPPTL.[3] Table 1 shows additional summary information on the effect of the project on selected products in the standard. The IAB officially endorsed the 2008 edition of the NFPA 1999 standard.

PPE products certified to NFPA 1999, 2008 edition of the NFPA standard [2] are now available, enabling a level of protection not previously provided to the nation's EMS responders and hospital-based first receivers. The certification of individual products allows users to select the appropriate level of protection necessary for each response. As of November 17, 2008 there were 26 manufacturers with a total number of 82 products certified to the 2008 edition of NFPA 1999. Two notable areas for increased certification are reusable footwear and work gloves. These two areas had seen relatively little or no certification efforts prior to the 2008 edition. The expectation is for this trend to continue with single use garments and single use footwear.

**Table 1. Summary of Changes Resulting from NPPTL Research Data to NFPA 1999 Requirements for Key Product Items**

Select NFPA 1999 Products	Comment
Single-use garments	Project data resulted in significant changes to requirements in physical properties. The new requirements are appropriate for single-use applications instead of mirroring the multiple-use requirements.
Multiple-use garments	Project results led to splitting single- and multiple-use criteria. Certain criteria were increased to reflect the greater durability needed of multiple-use garments. Flammability resistance and an optional visibility evaluation criterion were added.
Cleaning/utility gloves	Significant changes were made to remove mutually exclusive criteria. Research data supported a change in dexterity testing that now more closely resembles the work expected while using cleaning gloves. The puncture resistance requirement was reduced slightly, and a tactility test was added to result in a glove that better fits users' needs.
Work gloves	Project data prompted a reduction in the abrasion requirement for the glove shell material.
Footwear covers	Project data resulted in changes to the requirements. Design changes included better coverage of the primary foot protection. Performance criteria for the uppers were based on the single-use garment requirements. The sole evaluation was enhanced with increased testing through a more severe durability test and a different puncture test.
Eye and face protection devices	This area was divided into three categories including single-use eye/face wear, multiple-use eye/face wear, and medical face masks. Project data supported the addition of an antifogging test and a synthetic blood penetration resistance test.

### **Development of a Standard Test Practice for Determining the Physiological Responses of the Wearer to Protective Clothing Ensembles**

Protective clothing ensembles such as firefighter turnout gear, HAZMAT suits, and bomb suits may impose a physiological strain on the wearer. A brief review of the IAB Annual Reports starting in 2002 indicates that the IAB has been a strong advocate for research and standards development on technologies to mitigate these physiological hazards. For example, the 2003 IAB Annual Report specifically recommends "that an effort be undertaken to gather physiological performance data from a population of emergency responders and validate this performance model for use by the emergency responder community and also manufacturers of response PPE." One of the key challenges to meeting this IAB recommendation was the lack of a standardized, universally accepted test practice for the evaluation of the physiological "burden" imposed by PPE ensembles worn by workers and responders.

In 2004, NPPTL was funded by TSWG to conduct an evaluation of the physiological stress imposed by, and ergonomic characteristics of, a prototype firefighter ensemble with chemical/biological hazard protection. This task was part of the International Association of Fire Fighters (IAFF) Project HEROES® effort under contract with TSWG, discussed in detail elsewhere.[4] Because no standard test methods for ergonomic or physiological evaluations existed at the time, NPPTL needed to create protocols for human subject testing to measure parameters relevant for the evaluation. Based on feedback and encouragement from IAB members, the test procedures used in the study were also deemed to be relevant to other types of responders and PPE. Thus, starting in 2005, after data collection was in process, NPPTL and the project partners took the test procedures developed for Project HEROES and approached ASTM International's F23 Committee on Protective Clothing and Equipment about creating a series of standard test practices which could be used to gather performance data on PPE used in the emergency response community. The first resulting product, ASTM F2668-07, was published in 2007.[5] The original Project HEROES protocol focused primarily on firefighting activities, while F2668-07 was broadened to allow laboratories a choice of activities. This flexibility within the standard allows for the same general procedure to be used for evaluation of various PPE designs for a range of applications.

The reliability of the physiological data obtained from using this standard practice can be assessed using data from the Project HEROES evaluation.[6] In the evaluation, 10 subjects wearing NFPA 1971 (2000 edition)–compliant bunker gear and a NIOSH- and NFPA-certified SCBA were asked to exercise on a treadmill while being measured for a variety of physiological parameters, including skin temperature, internal (“core”) body temperature, and heart rate. The same 10 subjects repeated the protocol on a different day. For each session, the changes in skin temperature, internal temperature, and heart rate at two time points (0 minutes and 20 minutes) were determined. For a test method to be deemed reliable, the changes in these physiological parameters should be consistent from session to session. Comparing the two sessions, the differences in the three physiology parameters were on average less than 20%.

There are several advantages to using the new ASTM F2668-07 standard practice. Ensemble testing is usually conducted in isolation by a variety of laboratories that do not always employ the same methodology, terms, definitions, or equipment. The standard practice provides a means for all laboratories conducting evaluations or research on protective ensembles to compare data from lab to lab, thus making the ensemble evaluations more robust. Future research and evaluation testing of new ensemble technologies (e.g., portable physiological sensors, total heat loss of subjects wearing ensembles, portable body-cooling technologies, etc.) can employ the ASTM Standard Practice, thus reducing the need for extensive protocol development, enabling faster human subjects review board approvals, and improving study to study data comparison. Another benefit of the ASTM standard practice is that it can be used by other consensus standards development organizations (e.g., NFPA, International Organization for Standardization) to set performance standards and PPE specifications. Moreover, the lessons learned from the physiological evaluation of the Project HEROES ensemble and the ASTM standard practice are applicable to other types of first responder PPE (HAZMAT, EMS, law enforcement, bomb disposal suits, etc.), industrial PPE (asbestos remediation, chemical industry workers, etc.), and medical workers (first receivers, pandemic response).

As there was not a standard practice for physiology testing in existence at the time Project HEROES began, there was also no standard practice for the ergonomics testing. A human subject–based ergonomics protocol was also developed by NPPTL as part of Project HEROES. Ultimately, the ergonomics data proved to be of great value for comparing different ensembles.[7] Thus, the ergonomics test methods used for Project HEROES can also serve as the basis for a future ASTM standard practice for ergonomics testing. The use of complementary physiology and ergonomics test practices will lead to ensembles with improved comfort, usability, and safety.

## Conclusions

The IAB is an important partner for NPPTL in fulfilling its mission to prevent work-related injury, illness, and death by advancing the state of knowledge and application of personal protective technologies. The IAB provides valuable information concerning responder PPE needs and also serves an important role in transferring research to practice.

## Acknowledgements

Dr. Jon Williams is thanked for providing the Project HEROES data and his careful review of this paper. International Personnel Protection, Inc. provided technical support to NIOSH on the EMS project via contract # 214-2006-M-15870. International Personnel Protection, Inc. and the IAFF are thanked for their technical support related to Project HEROES and the development of the physiology standard.

## Disclaimer

The findings and conclusions of this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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## Summary of Current Research and Development by SEL Category

Project	Description	Managing Agency/ Participants	Availability/Status
<b>SEL Category 01 - Personnel Protective Equipment</b>			
CB/Smoke Escape Hood	Provides 15-minute escape capabilities from smoke and chem/bio incidents	www.tswg.gov Essex Inc.	FY09
End-of-Service-Life Indicator for Respirator Cartridges	System to indicate remaining service life of chemical filter cartridges	NIOSH/NPPTL/DOD	Ongoing development
Land Warrior Project	Integrated protection, detection, and communications ensemble for soldiers	www.natick.army.mil	Ongoing development
Long-Duration Tactical SCBA	A lightweight, low-cost, low-profile, long-duration closed-circuit SCBA (rebreather) for law enforcement tactical operations	www.technicalproductsinc.us www.tswg.gov	Ongoing development. Prototype available
Next Generation of Turn-Out Gear for Fire Service	Protective firefighter ensemble that provides integrated chem/bio protection	www.tswg.gov DHS S&T	FY 09
Risk-Based Protective Clothing Material Permeation Criteria	Develop realistic permeation end-point criteria and test methods for toxic industrial chemicals (TICs) based on dermal toxicity data	www.tswg.gov International Personnel Protection Inc.	FY09
<b>SEL Category 02 - Explosive Device Mitigation and Remediation</b>			
Next-Generation Bomb Suit	Improved bomb suit with integrated chemical protection	www.tswg.gov	FY10
Next-Generation Handheld Explosives Detector	Improved handheld explosive detector for residue, imaging, and personnel screening	www.tswg.gov	Ongoing development
Suicide Bomber Detection	System using ultrasound	www.tswg.gov	Ongoing development
<b>SEL Category 03- CBRNE Operations and Search and Rescue Equipment</b>			
Standoff Patient Triage	Device to identify viable patients in mass casualty incident	www.tswg.com Boeing	Ongoing development
Vehicle Retrofit Kit for Mass Casualty Evacuation	An easy-to-install kit that rapidly transforms a transit or school bus into an evacuation vehicle following a large-scale CBRNE incident or natural disaster	www.tswg.gov Raytheon	FY09 functional prototype available
3-D Personnel Locator	Device to locate personnel in three dimensions	www.tswg.gov DHS	Ongoing development
<b>SEL Category 04 - Information Technology (Software)</b>			
Handheld Heat Stress Assessment Tool	Software tools compatible with handheld PDAs or laptops that rapidly assess heat stress while wearing PPE	www.tswg.com Geomet Technologies Inc.	Baseline tool available FY08. Expanding PPE ensemble data in FY09.
<b>SEL Category 05 - Cyber Security Enhancement Equipment</b>			
Detection of Novel Attacks Against Network Servers	Intrusion detection of network servers against viruses and cyber attacks	www.tswg.com	Ongoing development
Passive Network Mapping Tool	Rapidly assess cyber network performance	www.tswg.com	Ongoing development
<b>SEL Category 06 - Interoperable Communications Equipment</b>			
Small, Portable Voice Radio Repeater System	Hockey puck-sized radio repeater system to maintain voice communications in collapsed buildings and tunnels	www.tswg.com DTC Inc.	Prototype available FY08. Operational testing in progress
<b>SEL Category 07 - Detection</b>			
Alpha and Beta Contamination Detection in Water	An automated batch analysis system to detect alpha and beta emitters in static and flowing potable water systems	www.tswg.gov EPA SRNL	Project discontinued due to limits in sample preparation system



## Summary of Current Research and Development by SEL Category - *Continued*

Project	Description	Managing Agency/ Participants	Availability/Status
<b>SEL Category 07 - Detection - <i>Continued</i></b>			
Biological Aerosol Mass Spec (BAMS)	Real-time detection, identification, and warning for hazardous biological agents in complex interferent back-grounds	www.tswg.gov LLNL	Ongoing development
Distributed Chemical Sensing and Transmission	A fiber optics-based distributed sensing system that rapidly detects, identifies, and alarms the presence of TICs and CWAs at below IDLH levels	www.tswg.gov IOS	Prototype. Field testing FY08 and 09
<b>SEL Category 08 - Decontamination</b>			
Enzymatic Decontamination	Decontamination solution using enzymes to break down chemical and biological contaminants on equipment and in the environment	www.sbcom.army.mil	Ongoing Development
Plant and Animal Tissue Gasifier	A transportable gasification system for large-scale disposal of contaminated plant material and animal carcasses	www.tswg.gov BGP Inc. EPA USDA	Prototype testing in FY09
<b>SEL Category 09 - Medical</b>			
Ocular Scanner for Chem/Bio Agents	Portable, handheld, and automated triage tool for noninvasive assessment of acute or chronic exposure to TICs, CWAs, and toxins	www.tswg.gov MD Biotech	Operational testing FY09
<b>SEL Category 10 - Power</b>			
Fuel Cell for Continuity of Operations	Develop and demonstrate fuel cell technology to improve the logistical sustainment of critical response operations	www.tswg.gov	Continued operational testing FY09
<b>CBRNE Training Technologies</b>			
<b>Miscellaneous</b>			
Nano-Material and Nanotechnology Research and Development	Application of nanotechnology materials for chemical-biological detection and protection	www.raytheon.com	Ongoing development

## Summary of Available Research and Development by SEL Category

Project	Description	Managing Agency/ Participants	Availability/ Status	Technology Readiness Level
<b>SEL Category 01 - Personnel Protective Equipment</b>				
Body Armor Cooling System	Lightweight, low-cost, cooling capability designed to be worn under body armor	www.tswg.gov www.technicalproductsinc.us	Available	
CB Escape Hoods	Provides 15-minute escape capabilities from chem/bio incident	www.tswg.gov MSA Response Hood ILC Dover Scape Hood Survivair Quick Pro	Available	
Development of Computer-Aided Face Fit Evaluation Methods	Establish updated database of facial characteristics that can be used by respirator manufacturers to develop better products and by NIOSH for certification	NIOSH/NPPTL	Completed. Data available.	N/A
Drink System for Powered Air-Purifying Respirator (PAPR) and Self-Contained Breathing Apparatus (SCBA)	Provides hydration capabilities while wearing a facepiece	www.tswg.gov	Completed. Technical design available upon request from TSWG.	Ready for production
Hazmat/USAR Ensemble	NFPA 1994 Class II-rated ensemble, form-fitting, composed of durable materials that withstand urban search and rescue operations	www.tswg.gov Gore Lion Apparel	Available	
Physiological Models and Countermeasures for PPE	Develop better methods for assessing the physiological effects of wearing protective clothing ensemble and cooling garments	NIOSH/NPPTL	Completed. ASTM standard F2668-07.	7
<b>SEL Category 02 - Explosive Device Mitigation and Remediation</b>				
Joint Robotics Program	Improved improvised explosive device (IED) response robotics	www.tswg.gov	Available	
Vehicle-Borne IED Detection	Remote detection enhancement, X-ray-based screening system for vehicles	www.tswg.gov Quantum Magnetics	Available	
<b>SEL Category 03 - CBRNE Operations &amp; Search &amp; Rescue Equipment</b>				
Modular Portable Air Filtration Unit	CBR positive-pressure air-filtration system for small rooms	www.tswg.gov www.germfree.com	Available	
<b>SEL Category 04 - Information Technology</b>				
Sensor Web	A wireless telemetry-based sensor communications system	www.tswg.gov JPL	Available	
<b>SEL Category 04 - Information Technology (Software)</b>				
Handheld Hazard Assessment Tools	Software tools compatible with handheld PDAs or laptops that rapidly assess chemical spill hazards	www.tswg.gov www.aristatek.com Georgia Tech	Available	
<b>SEL Category 05 - Cyber Security Enhancement Equipment</b>				
<b>SEL Category 06 - Interoperable Communications Equipment</b>				
<b>SEL Category 07 - Detection</b>				
Active LWIR (Long-Wave Infrared) Plume-Tracking System for Facility Monitoring	Spectral imaging of a TIC release in a large confined space	www.tswg.gov	Available	
Detection of Toxic Adulterants in Food	A compact and simple-to-use test kit that rapidly and accurately detects poisons in food through the use of color change chemistry	www.tswg.gov Appealing Products Inc.	Available	



## Summary of Available Research and Development by SEL Category - *Continued*

Project	Description	Managing Agency/ Participants	Availability/ Status	Technology Readiness Level
<b>SEL Category 07 - Detection - <i>Continued</i></b>				
Facility Alarm System for Airborne Biological Toxins	A highly specific detection system using novel field asymmetric ion mobility spectrometry (FAIMS) technology to monitor indoor facilities and HVAC systems for the presence of biological toxins	www.tswg.gov www.draper.com	Available	
Non-PCR Detection of Bio Agents	A gold nanoparticle- and antibody-based field-portable assay for rapid detection and identification of biological agents, which is much simpler to use and operate than conventional polymerase chain reaction (PCR) methods	www.tswg.gov www.nanosphere-inc.com	Available	
Real-Time Radioisotope Detection and Reporting	Handheld device that rapidly detects radioisotopes and wireless capability to transmit gamma spectral data to Department of Energy (DOE) triage systems for confirmation of radiological spectral data	www.tswg.gov www.saic.com	Available	
Self-Indicating Radiation Dosimeter	A beta/gamma self-reading radiation dosimeter badge measuring cumulative dose for rapid assessment of radiation exposure so responders can quickly assign triage levels	www.tswg.gov JP Labs	Available	
Small CAD	Portable, handheld detector that combines surface acoustic wave and ion mobility spectrometry detection technologies for improved sensitivity and low false alarm detection of TICs and CWAs	www.tswg.gov www.saic.com	Available	
<b>SEL Category 08 - Decontamination</b>				
Atmospheric Plasma Decontamination	Neutralize biological agents on sensitive items without damaging materials through the use of room temperature antimicrobial gases (plasma)	www.tswg.gov Atmospheric Glow Tech	Available	
Disinfection By-Products Database	Database of gas/vapor by-products resulting from the decontamination of various building materials	www.tswg.gov www.utexas.edu	Available	
Electrostatic Decontamination System	A spray-on decontamination solution for rapid (UV light-activated) neutralization of chemical and biological agents	www.tswg.gov www.cleanearthtech.com	Available	
Expedient Mitigation of a Radiological Release	Easily applied and removable adsorbent coating systems to mitigate the spread of radiological contamination	www.tswg.gov Istron Argonne National Labs DHS (S&T)	Available	
Mass Personnel Decontamination Protocols	A handbook containing consensus-based best practices and procedures for CBR mass decontamination	www.tswg.gov www.cbic.apgea.army.mil	Available	
WMD Overpack Bag	Durable, puncture-resistant, impermeable, and chemically resistant overpack bag with robust sealing mechanism to prevent the spread of contamination from a chem-bio contaminated source, operational equipment, or improvised dispersion/dissemination device	www.tswg.gov www.ilcdover.com	Available	
<b>SEL Category 09 - Medical</b>				
Bio-Dosimetry Assessment Tool (BAT) Integration	Software with information resources and tools for emergency response and health care providers to help identify and manage radiation casualties	www.tswg.gov AFRRI	Available	
<b>SEL Category 10 - Power</b>				

## Summary of Available Research and Development by SEL Category - *Continued*

Project	Description	Managing Agency/ Participants	Availability/ Status	Technology Readiness Level
<b>CBRNE Training Technologies</b>				
Agricultural Bioterrorism Response Training	Accredited, modular, agricultural bioterrorism response training curriculum for classroom, CD-ROM, or web-based distance learning applications	www.tswg.gov www.aphis.usda.gov	Available	
Explosives Simulant Kit	Training kit to educate first responders on explosive signatures and warnings	www.tswg.gov www.cbiac.apgea.army.mil	Available	
Food Protection and Security Training for Critical and Overseas Facilities	Modular, CD-ROM, and web-based training program for food supply chain personnel covering food protection, supply chain traceability, risk management, communication, and international food security law	www.tswg.gov www.cfsan.fda.gov	Available	
Low-Cost Shelter-In-Place Equipment and Training for Public Buildings	Training video that outlines specific steps and procedures to prepare an effective sheltering-in-place plan and kit for public building/facility managers	www.tswg.gov	Available	
WMD Panic Response Operations (WMD-PRO) Course	Accredited consequence management training course for federal, state, and local personnel covering the psychological impacts and effects of a weapon of mass destruction (WMD) incident	www.tswg.gov Early Responders Distance Learning Center at Saint Joseph's University	Available	
<b>Miscellaneous</b>				
CB Building Protection Protocols	Software that assists engineers in the design/retrofit of collective protection systems for buildings/critical facilities	www.tswg.gov www.utrc.utc.com U.S. Army Corps of Engineers	Available	

## \*DHS-Funded Standards Programs at NIST/OLES

Title	Description
<b>Explosives</b>	
Trace Explosives Standard Reference Materials	This project will provide two types of standards for trace explosives detectors: physical test materials of well-characterized composition and test protocols for equipment performance validation.
Canine Training Standards	This project will develop and provide metrology, standardized test materials, and protocols required to render canine detection of explosives a more exact science.
Trace Explosives Detection Standards - Equipment Performance Standards	This program supports all aspects of trace explosives screening, from sampling to analysis, and ultimately leads to improvements in the reliability and effectiveness of trace explosives detection systems as well as supporting development of next-generation detection technologies.
Standards for X-Ray Inspection Systems	National standards for X-ray and gamma-ray security screening systems and their validation.
Home Made Explosives (HME) Vapor Detection Standard	Information management, on-demand evaluation, and dissemination systems for properties of novel explosives.
Liquid Explosives Standards Development	Develop software that can accurately identify hazardous and nonhazardous liquids from complex permittivity data.
Near-Infrared to Radar Frequency Explosive Device Imaging and Detection Phenomenology	This work will result in a more thorough understanding of the type of explosive devices and components, concealments (barriers and obscurants), and electromagnetic wave properties (frequencies, modulations, bandwidths, polarizations, geometry) that will allow detection and/or visualization of explosive devices and components for given scenarios.
<b>CCI: IM Training and Process Standards</b>	
Incident Management Standards	Identify and develop IM standards in support of IM Integrated Product Team needs.
<b>CCI: Communication Standards</b>	
Modeling, Simulation and Analysis	This project will identify a taxonomy of MS&A application areas that are critical to meeting DHS needs and a high-level set of functional and data requirements for those application areas.
<b>Infrastructure/Geophysical: PP&amp;OE</b>	
CBRN Respiratory Standards Development	The project objective is to support development of NIOSH-approved CBRN respiratory protection equipment standards against terrorism agents for emergency first responders and public safety workers.
ECBC Support to Chemical Respiratory Standards	This project is a continuation of work via an existing Interagency Agreement. Participants include ECBC, which is the premier facility for handling CWAs, skills, and disposal of such. NIOSH is developing standards for respiratory equipment.
Respiratory Threats for First Responders	Real-time environmental and personal exposure equipment has been developed and is currently available and approved for use in occupational health and safety applications. The major outcome of this effort will be documented performance metrics and testing protocols to support standards development as well as a documented source of recommendations for improving and refining the technology to meet the specific needs of the fire service and first responders.
Chemical PPE Standards	Identify TICs which are a dermal threat to emergency responders and develop near-real-time permeation test methods for the identified TICs. Provide technical support for the development of chemical requirements to ASTM International, NFPA, NIJ, and TWSG.
Wear and Tear for Tactical LE CB Ensembles	This work will validate and upgrade the wear and environmental conditioning protocol currently being developed based on a gap in material/testing performance.
Reactive Cooling Systems	Develop performance metrics and standard testing protocols for reactive protective clothing for firefighters and other first responders that use reactive cooling to respond to short-duration high thermal load.
<b>Infrastructure/Geophysical</b>	
Respirator Sensor Placement	Determine locations within a respirator mask that are suitable for placement of a sensor for real-time monitoring of respiratory intake using computational methods.
Characterizing Respirator Fit for Real Faces and Masks	Characterize the relationship between respirator fit and the dimensions of faces and respirators using actual material properties of skin and rubber or silicone seals. The respirator models used for this project are three sizes of a Draeger full-face mask. The respirator masks are numbered R56250, R56301, and R56462, although these may be internal numbers rather than model numbers. This year the computer models assume a rigid face with a flexible mask, but next year the plan is to add the properties of real skin over bone to the model. This will be done by working with a medical database and possibly with medical researchers to obtain the geometry. Skin properties will be obtained from existing literature.

**\*DHS-Funded Standards Programs at NIST/OLES - Continued**

Title	Description
<b>Infrastructure/Geophysical - Continued</b>	
Respirator Performance Standards	Develop performance metrics and standard testing protocols for respirator masks for firefighters and other first responders under high-temperature conditions.
Structural Design for Fire	Develop a unified performance-based methodology for evaluating the fire behavior of steel and concrete structures.
Explosive Containment Standard (BRTR)	Develop test method specifications and deployment guides for determination of the effects of blast on containers designed to hold trash.
Structural Ignition in Wildland/Urban Interface (WUI) Fires	WUI is defined where structures meet or intermingle with undeveloped wildland. This project will work to develop a rapidly deployable system to use during actual WUI fires.
Radio-Frequency Identification (RFID) for Responders: Rough-Duty Environment Standards	This work will facilitate consensus standards to ensure adequate performance in rough-duty environments for RFID systems. These RFID tag-based systems are used by first responders to identify people and assets in homeland security applications. For rough-duty conditions such as high-temperature environments, this work will provide measurement data, performance metrics, test methods, and input to relevant standards. Examples include guidance documents, assistance in writing standards, and publication of best-practice test methods in the areas of rough-duty applications.
Economic Standards Development	This effort is an interdisciplinary research program composed of two parts and requires the participation of the Office of Applied Economics and the Structures Group of the Building and Fires Research Laboratory (BFRL) to deal with the economic aspects of risk management and the standards to be developed by BFRL's Office of Allied Economics.
Blast Standards for Buildings	This project deals with developing standards for security-related issues in constructed facilities as well as vulnerability assessment tools for same.
<b>Human Factors: Credentialing</b>	
Biometric Standards Development: First Responder Authentication Card (FRAC) Card Issuance, Usage, Test Procedures, and Technology Migration	Development of a new suite of international standards that is based on previous smart card interoperability projects. The standard will provide a framework for identity credential interoperability.
<b>Human Factors: Biometric Equipment Standards</b>	
Latent Fingerprint Analysis	This work will lead to significant gains in fingerprint matcher technology through specific contributions in the areas of matcher and fusion algorithm performance, matcher software, matcher hardware, standardized one-to-many latent test methodology, and standards for latent and candidate list interchange.
Usability for Biometrics Systems	Developing biometric standards and tests to ensure that a nationwide biometrics system can accurately identify individuals.
Standards for Image Quality	The work is directed at standards in three related domains: interoperable biometric data, multimodal and multisystem fusion, and biometric data quality. Together these generalize and extend prior activity on biometric quality.
Biometric Standards and Interoperability Coordination	The work is directed at supporting DHS in coordination of all biometric standards, testing and analysis activities wherever they occur in the department. The concept is to connect the needs of the operational functions to the technical actions of the standards developers while supporting and acting upon guiding policy directives.
MBARK (Multimodal Biometric Application Resource Kit)	Drive technology transfer activities that will facilitate the development of high-quality biometric personal identity verification applications using MBARK as the baseline.
Evaluation of Transportation Worker Identification Card Technologies	Develop verification models and executable programs for the categories of TWIC Card Application Interface Conformance Tests and TWIC Data Model Conformance Tests.
RFID Communication Standards	This work will facilitate consensus standards to ensure secure and reliable communication in RFID systems that are used to identify people and assets in homeland security applications by providing measurement data, performance metrics, test methods, and input to relevant standards.
<b>Chem/Bio: Chemical</b>	
Chemical Detection Standards	The program will continue to work through the ASTM E54.01 Detectors and Sensors Subcommittee to update the published E2411 Chemical Warfare Vapor Detector Standard, develop additional application specific chemical warfare vapor detector standards, and develop and modify toxic industrial chemical and material vapor detection standards.

**\*DHS-Funded Standards Programs at NIST/OLES - Continued**

Title	Description
<b>Chem/Bio: Chemical - Continued</b>	
Instrument Standards for Chemical Detection	The goal of this project is to develop and disseminate measurement tools to improve the accuracy and reliability of chemical measurements related to homeland security, e.g., measurements of TICs, toxic industrial materials, CWAs, and toxic contaminants of food and water.
Personnel Decontamination standards	This project will enhance public safety by publishing standards for CBRN decontamination equipment that ensure acceptable performance, quality, reliability, and interoperability.
VSP Support	This project will apply experimental and sampling design methods, uncertainty and confidence techniques, and other statistical techniques to support developing validated environmental sampling procedures and methods to respond to biological contamination.
Validated Sampling Methods for Biological Agents	This program will address gaps in the validated sampling of biological agents as well as develop a guidance document for use by the sampling community as defined by the Validated Sampling Plan Workgroup and also use multizone airflow and contaminant transport computer modeling to support additional rounds of sample collection operational tests at Idaho National Laboratory.
<b>Chem/Bio: Biological</b>	
Laboratory Reference Materials for High-Priority Biological Threats	This program will build and expand on the results obtained from previous work. It will enhance the measurements of the two high-priority threats: <i>Bacillus anthracis</i> spores and ricin.
<b>Platforms</b>	
USR Robot Metrics and Standards	This program will leverage and extend the considerable infrastructure set up to develop standard test methods.
HAZMAT Equipment Standards	The work will define for design and test purposes the environment in which hazardous materials (HAZMAT) equipment will likely be exposed during storage, transportation, and use. The environments addressed by this standard are related to equipment that are typically man portable, body worn, hand carried, transportable, mobile, or installed.
Responder Detector Performance Standards (Rad/Nuc)	This project is to assist with the development of radiological instrument performance and testing requirements for first responders.
Radiation and Nuclear Detector Standards and Validation for Response and Recovery	This project address the development of national consensus standards for homeland security radioactivity and radiation measurements and the technical infrastructure supporting the standards.
Counter-MANPADS Performance Standards	This project will develop a technical documentary standard that details the testing and modeling necessary to objectively quantify the performance of direct infrared countermeasure (DIRCM) systems deployed on wide-body and narrow-body fixed-wing commercial passenger aircrafts.
Standards for Sensor Networks/ Sensor Standards Harmonization	This work will facilitate the development of consensus standards for the integration and networking of sensors to support DHS customers.
<b>Location Technology: GIS Interoperability</b>	
Performance Metrics and Transmission Standards for RF Equipment	This project will provide performance metrics, propagation data, and verification tests to facilitate development of transmission standards for radio-frequency (RF)-based emergency equipment for first responders. These devices, which include personal alert safety system (PASS) devices, emergency beacons and locators, radios, and body-worn personal area networks (also called body area networks) will be tested for signal penetration and transmission within different building types, and from these tests, appropriate performance metrics will be developed.
Thermal Exposure Measurements for First Responder	This project is designed to evaluate the adequacy of current thermal equipment standards for electronic devices used by first responders. The project will provide the scientific basis for standards development and recommendations for new or revised standards and will develop test methods to validate product compliance.

\* For additional project information contact the IAB S&T Committee

### **Malcolm Trigg**

*Battalion Chief, Special Hazards and Operations Team, Seminole County Fire Rescue, Seminole County, Florida*

The Seminole County Special Hazards & Operations Team (SHOT) is the result of the coordinated efforts of the Seminole County Fire Department and Emergency Management Division. The Special Hazards & Operations Team was formed in 1992 by combining the functions of the existing Hazardous Materials Response Team with heavy/technical rescue and water rescue responsibilities. SHOT is managed by Battalion Chief Malcolm Trigg.



### **Gabriel Ramos**

*Chemical Biological Program Manager  
Technical Support Working Group*

Gabriel Ramos is a program manager for TSWG, providing management and technical oversight for the execution of the CBRN countermeasures rapid R&D program. He has 21 years of experience developing and evaluating CB capabilities for DOD and the federal interagency combating terrorism community. Mr. Ramos has a B.S. in chemical engineering from the Polytechnic University, Brooklyn, N.Y. and is also a graduate of the U.S. Army School of Engineering Logistics Product/Production Engineering Program.

# Compatibility *and* Interoperability Committee (CIC)

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## CO-CHAIR

**Robert J. Ingram**  
*Fire Department, City of New York (NY)*

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## FEDERAL CO-CHAIR

**Philip Mattson**  
*Department of Homeland Security, Science and Technology Directorate, Office of Standards (formerly, National Institute of Standards and Technology), Office of Law Enforcement Standards)*

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## Membership

**Tauseef Badar**  
*United States Marine Corps*

**Roberta Breden\***  
*Department of Homeland Security, Federal Emergency Management Agency, Technology Support Branch*

**Chris Callsen\***  
*Austin-Travis County (TX) Emergency Medical Services*

**Timothy Fisk**  
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**Martin Hutchings**  
*Sacramento County (CA) Sheriff's Department*

**Luke Klein-Berndt\***  
*Department of Homeland Security*

**Greg Noll**  
*South Central (PA) Counter-Terrorism Task Force*

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## Subject Matter Experts

**Ed Bailor**  
*United States Capitol Police (Retired)*

**Kathy Higgins**  
*Department of Homeland Security, Science and Technology Directorate, Command, Control and Interoperability Division*

**Neil Holloran**  
*Naval Facilities Anti-Terrorism/Force Protection Ashore Program Naval Surface Warfare Center Dahlgren*

*\* As of January 2009, these members are no longer active with the IAB.*



**The CIC served as the focal point for the coordination of interoperability and compatibility issues identified by the IAB. The CIC consolidated and prioritized equipment, standards, training, and operational interoperability and compatibility concerns identified by the IAB SubGroups and Committees. The CIC worked in coordination with the SCC and S&T Committee and SubGroups to develop interoperability and compatibility requirements and identify potential solutions.**

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## Membership

The CIC consisted of member representatives and SMEs who addressed domestic preparedness equipment, systems, and protection issues related to specific interoperability and compatibility issues. It included representatives from each of the IAB SubGroups and Committees. 2008 was the last year that the CIC was organized as a separate IAB Committee. In 2009, as part of a restructure of the IAB, the CIC functions will be merged into the SCC.

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## Roles and Functions

The CIC complemented and supported the standards development activities of the SCC and the technology development recommendations of the S&T Committee by the following:

- Coordinating and consolidating interoperability and compatibility issues identified by the SubGroups, SCC, and S&T Committee
- Identifying potential solutions in terms of standards, equipment development, training, or policy requirements to assist the responder community
- Coordinating reports from in the IAB Committees and SubGroups identifying specific interoperability and compatibility issues
- Providing input to support SCC and S&T Committee activities
- Identifying existing programs that are addressing interoperability and compatibility issues
- Summarizing IAB interoperability and compatibility issues, priorities, and potential solutions in the IAB Annual Report

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## Accomplishments

The CIC was the newest committee in the IAB, established in 2006. It enabled the IAB to fully serve as the “InterAgency Board for Equipment Standardization and Interoperability.” In 2006, the CIC developed an initial summary report of compatibility and interoperability issues identified by the IAB SubGroups, and then refined and updated the list in 2007 as more information became available. This



year the table is updated to include the potential solutions for the compatibility and interoperability issues identified by the IAB is at end of this section.

We continue to use the following definitions for the terms “interoperable” and “compatible” when using these terms to address noncommunications systems:

- **Compatibility**—Systems that work together to accomplish a common task with no modification or conversion required and that do not interfere with other systems (e.g., all hose and hydrant couplings are the same, or everybody speaks the same language).
- **Interoperability**—Use of converters, adaptors, translators, etc. to enable systems to work together to accomplish a common task (e.g., use of adapters for hose couplings or the use of a translator).

## Summary

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The CIC will no longer exist as a separate committee in the IAB, but its functions will be incorporated into the expanded responsibilities of the SCC. We wish to thank those who served as members of the CIC and those who contributed to the CIC. We look forward to continued support to the IAB and the emergency response community.

## IAB Compatibility and Interoperability Issues—2008

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The following table summarizes the issues identified by the IAB SubGroups. The first column is the potential solution to the issue, whether it is in terms of doctrine, standards, policy, training, technology development, or testing. The “issue” column provides a short title of the concern, with the next column providing an expanded description. The last column indicates the IAB SubGroup that identified the issue.

## IAB Compatibility and Interoperability Issues—2008

Possible Solution	Issue	Description	SubGroup
Doctrine	CBRNE Threat Credibility	Parameters for differentiating suspicious vs. credible threats in evaluation of unknowns.	D&D
Doctrine	Security Clearances	Security clearances are still issues for many SME emergency responders. These SME are often asked to participate on focus groups but are not able to view all of the data.	D&D
Doctrine	Standardized Guidance on Purchasing Equipment	No universal guidance for all disciplines eligible for purchasing equipment and supplies with federal funds listed on the AEL (for example, Department of Health and Human Services operational divisions that provide substantial funding for equipment do not use the guidance/infrastructure developed and used by DHS (AEL, RKB, etc.) or the information/recommendations in the SEL).	MSG
Doctrine	NFPA 472/OSHA 1910.120	NFPA 472/OSHA 1910.120 diagram linkages between NFPA 470 series, HAZWOPER, and other federal-related standards and provide layman's interpretation and equipment implications to drive consistency of the application of standards.	TSG
Doctrine	NIMS Resource Typing Definitions	Revisit initial 120 NIMS resource typing definitions (example: SWAT—fit in with HAZMAT explosive ordnance disposal [EOD] definition). Conduct NFPA 1670/1006/470 series crosswalk. Identify impact of typing changes on PPE, equipment, and professional qualifications.	TSG
Doctrine/Standard	Medical Credentialing	Standardization by skill set or professional designation.	MSG
Doctrine/Training	Environmental Sampling Strategies and Evidence	Making sure evidence concerns are taken into consideration when writing standards on environmental sampling, chain of custody, etc.	D&D
Policy/Doctrine	Coordination at Federal Level of Response to and Recovery from RDD/IND Event	Incomplete guidance and policy regarding emergency responders' role in response to and recovery from a radiological dispersal device/improvised nuclear device (RDD/IND) event. This includes guidance on exposure, appropriate equipment, and techniques to use for response and recovery, etc.	D&D
Standard	How Clean is Clean?	Need across-the-board answer to the question.	D&D
Standard	Standard MSDS	Standard Material Safety Data Sheet.	D&D
Standard	ASTM Sampling Standard	Issues with feasibility of ASTM sampling standard. What is bio sampling? Standard field screen method and technology.	D&D
Standard	Standardized Chem/Bio Reporting	Standardized incident reporting, suspicious vs. credible.	D&D
Standard	Compatible Libraries	Raman, HazmatID need for compatible libraries. Legal issues: proprietary.	D&D
Standard	Uniform Health and Medical Surveillance	No nationwide inter-jurisdictional standards for sharing data sets in a timely manner for early detection of exposure to agents that cause disease or illness beyond normal parameters (consistent with HSPD-21).	MSG
Standard	Standardization of Batteries	From radios to all universal medical equipment.	MSG
Standard	Interoperability of Wireless PASS/Accountability Systems	Many different units show up. PASS and/or accountability system must pick up all groups during operation. Current PASS systems are not designed to be interoperable because there is no standard for their development.	PP&OE
Standard	Compatibility of Wireless Systems	All wireless systems (heads-up display [HUD] on SCBA) during operations must be compatible and interoperable to eliminate interference and crosstalk.	PP&OE
Standard	Safety Considerations	Review various relevant authorities (NIMS, Target Capability List, OSHA, etc.) for safety considerations and establish consistency in language. Crosswalk safety standards. Define roles, responsibilities, and professional competencies of an all-hazards safety officer. Identify a standard for Law Enforcement Safety Officer.	TSG
Standard	Competency-Based Performance Standards	Identify competency-based performance standards based on demonstrated knowledge, skills, and abilities. Competency-based performance standards should be used as the basis of training requirements for the 120 NIMS resource typing definitions.	TSG
Technology	Common Website to Post Field Equipment Issues	Lack of an electronic site for emergency responders to post field issues and equipment failures for all agencies to have access to in real time, e.g., PASS alarm high heat failures.	D&D
Technology	Wireless Communications	Plug and play.	D&D

## IAB Compatibility and Interoperability Issues—2008 - *Continued*

Possible Solution	Issue	Description	SubGroup
Technology	R&D Effort Coordination on All Equipment for Detection		D&D
Technology	On-Scene Wireless Compatibility and Interoperability	There is an increasing trend toward the use of wireless transmission for both voice and data communication at the incident scene, as well as for remote control of robotic devices and “reachback” detector technology. This trend is now expanding to encompass the individual responder and includes technology such as hands-free communication, wireless PASS technology, 3D locators, and sensor systems such as individual temperature or detection sensors that use Bluetooth technology. Problems with conflicting robot commands have already been demonstrated. Study is urgently needed to determine the impact of the various RF sources at an incident site on the increasing number of wireless devices, particularly those pertinent to individual responder life safety. Finally, this issue should also be examined from the standpoint of vulnerability to deliberate interference such as might be initiated by a terrorist seeking to disrupt response or incapacitate responders.	ICIS
Technology	Hands-Free Radio Intercom	Bluetooth or other capability that allows hands-free radio operations, e.g., bomb squad tech needs both hands to defuse bomb; paramedic working on patient with both hands; police officer with flashlight and weapon drawn or special weapons and tactics (SWAT) team member with equipment; and firefighter operating a monitor nozzle on a fire boat or dragging a victim to safety from a fire.	ICIS
Technology	Compatibility of SWAT Body Armor with SCBA	Current ballistic tactical vests hinder wearing the harness for SCBA.	PP&OE
Technology	Sight/Target Acquisition while Wearing Respiratory PPE	Law enforcement has difficulty acquiring proper sight alignment/sight picture and target acquisition while using weapons due to distortion from facepiece and standoff (inability to acquire proper stock/cheek weld).	PP&OE
Technology	Dexterity Issues with Gloves	Inability to perform job functions while wearing cumbersome PPE gloves, e.g., weapons manipulation, bomb render-safe procedures, HAZMAT detection equipment manipulation, evidence collection, medical triage, etc.	PP&OE
Technology	SCBA Facepiece/ Bombsuit Facepiece Interoperability	Only one manufacturer has SCBA with a facepiece that fits under the most common bomb suit facepiece.	PP&OE
Technology	Helmet Interoperability with Respiratory PPE	Respirator impedes correct fit/usage of all helmets (firefighting, ballistic, urban search and rescue (USAR)).	PP&OE
Technology	Underwater/Open-Water Communications (Wireless) Limitations	Limited communications with base station unless hardwired. Need wired equivalent wireless devices. Hardwire limits operations.	PP&OE
Technology	Personal Wireless Network Incorporating Multiple Items	There is a proliferation of technologies seeking to help the responder, such as location and tracking devices, physiological status monitors, communications, PASS devices and such. These devices must be able to operate together and not interfere and also must not add additional burden on the responder and incident commander. An integrated as opposed to piecemeal approach for development is needed.	PP&OE
Technology	Interoperability	Use of SWAT/HAZMAT/EOD/EMS PPE during a single event by nontraditional users (public works and utilities). Impact on next-generation PPE?	TSG
Testing	Test Data Sharing	Local, state, federal information access consistency (test data sharing or access, etc.).	D&D
Testing	Equipment Test Results	Often CBRNE equipment (detection) is tested when it is commercially available, but there is no standard to test it against for pass/fail or at the very least comparison to other similar equipment.	D&D
Training/ Standard	CAD-to-CAD Interface	The main challenge is that many dispatchers do not have access to personnel and resource information in neighboring jurisdictions. Currently, jurisdictions with unconnected CAD systems are faced with logistical problems when events occur on the border between two jurisdictions and require a multi-jurisdictional response. In these situations, dispatchers often engage in time-consuming phone calls to locate and dispatch the closest resources.	ICIS



### **Robert J. Ingram**

*Branch Chief, WMD and Disaster Preparedness Center for Terrorism and Disaster Preparedness, Fire Department, City of New York*

Robert Ingram is a 35-year member of the Fire Service, 27 years with FDNY. He is currently assigned to the FDNY Center for Terrorism and Disaster Preparedness as the WMD Branch Chief. He has 25 years of experience in hazardous materials response and has worked on WMD issues since 1997. Chief Ingram's experience includes course development and training, FEMA urban search and rescue, field operations, interagency exercises, and standards development. He has been a member of the IAB since 1999 and is a member of the NFPA 472 committee and a member at large with the ASTM E-54.02 committee. He received a bachelors degree in fire and emergency management from the State University of New York, a certificate from the Fire Officers Management Institute from Columbia University Graduate School of Business and the FDNY, and a certificate from the Naval Post-Graduate Schools' Executive Leadership Program.



### **Philip J. Mattson**

*Deputy Director, Department of Homeland Security, Science and Technology Directorate, Office of Standards (formerly, National Institute of Standards and Technology, Office of Law Enforcement Standards)*

Phil Mattson recently transferred from the Office of Law Enforcement Standards (OLES) at NIST where he served for the past six years as the Program Manager for Critical Incident Technologies. Mr. Mattson manages the execution of the DHS S&T Office of Standards diverse portfolio of projects. He is the Federal Co-Chair of the IAB CIC and a member of the ASTM E54 Committee on Homeland Security Applications, chairs the E54.08 Operational Equipment Subcommittee, and is a member of the ANSI Homeland Security Standards Panel and the NIJ Personal Protective Equipment Technology Working Group. A registered Professional Engineer, he received a B.S. in nuclear engineering technology from Oregon State University, an M.S. in physics from the Naval Postgraduate School, and extensive training in nuclear weapons and radiological incident management. Mr. Mattson served 20 years as an officer with the U.S. Army Corps of Engineers and as a nuclear physicist with the Defense Nuclear Agency and Defense Special Weapons Agency.

# Personal Protective & Operational Equipment (PPE&OE) SubGroup

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## CO-CHAIR

**Douglas E. Wolfe**  
*Sarasota County (FL) Fire Department*

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## FEDERAL CO-CHAIR

**William Haskell**  
*National Institute for Occupational Safety and Health  
National Personal Protective Technology Laboratory*

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**Armando Bevelacqua**  
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**Tim Dorsey**  
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**Bruce Teele**  
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**Forest Willis**  
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**Wayne Yoder**  
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*United States Marine Corps*

**Gary Bennett, DVM**  
*Cornell University*

**Glenn Jirka**  
*Miami Township (OH) Division of Fire and Emergency Medical  
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*Occupational Safety and Health Administration*

**David Otterson**  
*National Institute of Standards and Technology,  
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**Jeffrey Stull**  
*International Personnel Protection*

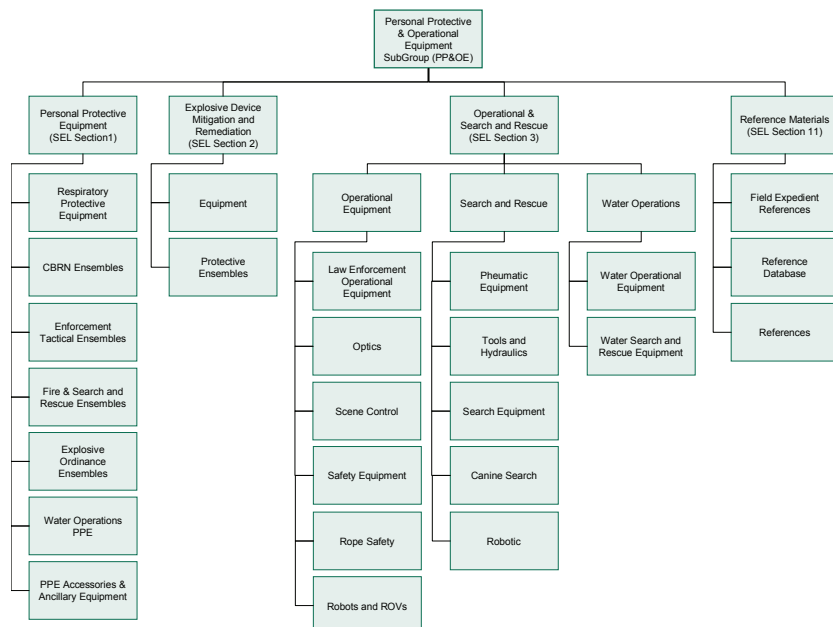


To address the issues of personal protective and operational equipment standardization and interoperability and make recommendations for PPE and operational equipment based on threat assessment, operational requirements, and job functions.

## Roles and Functions

The PP&OE SubGroup addresses the personal protection and operational equipment needs of responders to support their operations at CBRN or other all-hazards incidents. To develop recommendations for protective equipment, the PP&OE SubGroup conducts a gap assessment of existing and forthcoming standards. The SubGroup recommends that the selection of personal protective ensembles be based on a risk-based model, considering both the hazard to be encountered (hazard type and physical state) and the job function to be performed (probability of exposure or contact). If a gap is identified during the assessment process, recommendations are forwarded to the SCC to develop a mechanism to fill any identified standards-related issues.

### PP&OE Structure of Responsibilities



In addition to PPE, the PP&OE SubGroup supports the development of explosive device mitigation and remediation, operational, and search-and-rescue equipment and reference materials, performance criteria, and standards.

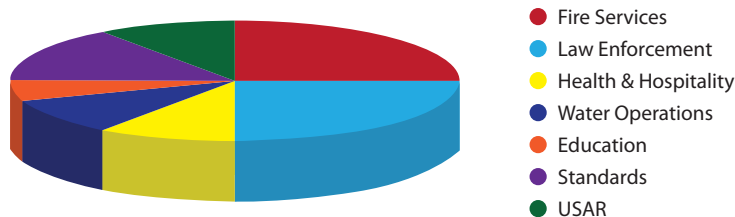
## Membership

The PP&OE SubGroup includes a wide range of SMEs from emergency response organizations, federal partners, and standards development organizations. This synergistic membership creates the ability to push forward initiatives for systemwide improvements and standards development. The current composition of the SubGroup is as follows:

- Response Organizations 70%—Representing the fire service, law enforcement, emergency medical service, medical first receivers, hazardous device operations, hazardous materials, search and rescue, and water operations.
- Federal Partners 30%—Representing NIOSH, Department of Veterans Affairs (VA), U.S. Coast Guard, National Fire Academy, DOD, and the U.S. Army Center for Health Promotion and Preventive Medicine.

The PP&OE SubGroup has wide representation from both labor and professional organizations such as the NFPA, ASTM International, International Association of Fire Fighters (IAFF), International Association of Chiefs of Police (IACP), National Tactical Officers Associations, and the National Bomb Squad Commander's Advisory Board. These organizations have been provided permanent assigned seats to the PP&OE SubGroup.

**PP&OE Membership by Discipline**



This membership enhances partnerships among 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 continue to be leveraged and, in some cases, fast-tracked for the benefit of the emergency response and public safety community. Bringing all the stakeholders to the table in a cooperative manner has been, and will continue to be, essential to the success of this SubGroup.

## Initiatives and Progress

In 2008 the PP&OE SubGroup focused on the following major strategic initiatives:

- Continued to make revisions to the PPE and Operational Equipment Sections of the Standard Equipment List working closely with the RKB staff.
- NIOSH Publication No. 2008-123 entitled “Guidance on Emergency Responder Personal Protective Equipment (PPE) for Response to CBRN Terrorism Incident” was released in June 2008 ([www.cdc.gov/niosh/docs/2008-132](http://www.cdc.gov/niosh/docs/2008-132)). The PP&OE SubGroup provided support in the development of this important responder guidance document.



- Support the IAFF project developing next-generation SCBA breathing air cylinder technology under contract to the Department of Homeland Security's (DHS) Science and Technology Directorate.
- Support the development of a proposed new NFPA 1952 Standard on Surface Water Operations Protective Clothing and Equipment and NFPA 1953 Standard on Protective Clothing and Equipment for Contaminated Water Operations. PP&OE SubGroup members and SMEs participate on the NFPA Technical Committee on Special Operations Protective Clothing and Equipment developing these new standards. NFPA Staff Liaison for this technical committee is also a member of PP&OE.
- Continued to advocate the development of performance criteria and development of standards for law enforcement protective ensembles for protection against CBRN hazards and provide PP&OE representation on the NIJ committee developing this standard.
- Support the development of the proposed NIJ CBRN Protective Ensemble Selection and Application Guide proposed for release in late summer 2009.
- Support the development of the proposed NIJ Bomb Suit Standard for Law Enforcement (NIJ Standard 0117.00). This proposed standard will set minimum performance requirements for protective bomb suits worn by law enforcement bomb technicians while performing operations to dispose of IEDs.
- A member of the PP&OE SubGroup was appointed to represent the IAB on the DHS Explosives Standards Working Group.
- Continued to advocate the development of data to provide guidance relating to effects of dermal exposure values necessary to aid in the proper design and selection of CBRN protective ensembles.
- Continued to support improvements in existing performance requirements and test methods for measuring chemical resistance of ensemble materials and next-generation respirators against CWAs and TICs.
- PP&OE supports the DHS Science and Technology Directorate with the personnel location and tracking for emergency responders research and development program and supporting contracts.
- PP&OE facilitated the attendance of NIOSH-NPPTL and DOD representatives who made presentations related to the design requirements in the NIOSH CBRN/APR standard and the DOD Joint Service General Purpose Mask.

## Standards Development Efforts

The PP&OE SubGroup encourages users of the IAB SEL to monitor the activities of various standards development organizations such as ASTM, NFPA, and NIJ at their respective websites. The subgroup also supports the efforts of the DHS Standards Portfolio Mission in providing resources and management oversight in the development and adoption of personal protective equipment and operational equipment standards.

Standards being developed by NFPA are:

- NFPA 1801 Standard on Thermal Imagers for the Fire Service
- NFPA 1952 Standard on Surface Water Operations Protective Clothing and Equipment
- NFPA 1953 Standard on Protective Clothing and Equipment for Contaminated Water Operations
- NFPA 1984 Standard on Respirators for Wildland Fire Fighting Operations



Standards being developed by NIJ are:

- NIJ CBRN Protective Ensemble Standard for Law Enforcement
- NIJ CBRN Protective Ensemble Certification Program Requirements
- NIJ Bomb Suit Standard for Law Enforcement
- NIJ Holster Standard for Law Enforcement

Performance Specification being developed by ASTM International Committee F23 on Protective Clothing and Equipment:

- Standard Specification on Air-Fed Protective Ensembles

## **Performance Criteria and Standards Gaps Identified by the PP&OE SubGroup**

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During 2008, the PP&OE SubGroup identified the following priorities for standards development:

### Law Enforcement PPE Standards

PP&OE continued to emphasize the urgency for the development of CBRN performance criteria for ensembles (garments, boots, and gloves) specific to law enforcement missions. These standards must take into consideration compatibility of ensemble elements with officers' duty/tactical gear and respiratory protective equipment. It must consider differences in performance criteria for mission roles such as those defined in the IAB SEL.

PP&OE emphasized the urgency for the development of performance criteria and a standard for protective bomb suits, including ballistic fragment, blast overpressure, and CBRN hazard protection.

### Dermal Exposure Standards for TICs

Requested standards for dermal exposure to TICs. The proper selection of personal protective ensemble is related to dosage-based dermal exposure limits which currently do not exist. Realistic values need to be developed to allow for the subsequent development of newer PPE technologies that are lighter weight, are less stressful, and that can be worn for longer durations. Establishment of dermal exposure limits based on cumulative dosage is essential to the fielding of new PPE technologies.

### Combination Respiratory Protective Equipment

Establish respiratory protective CBRN performance standards, test methods, and certification process for combination units such as APR/SCBA and PAPR/SCBA.

### CBRN PAPR Standard for Moderate and High Flow Rate Operations

A standard is required for CBRN PAPRs used in moderate and high flow rate operations. Current industrial PAPR systems may not allow for adequate flow rates during high exertion activity typical of emergency response personnel. This standard is included in the NIOSH modular revision approach to 42 CFR Part 84 Respiratory Protective Devices, including CBRN respiratory protective devices.

### Respiratory Protective Devices for Infectious Diseases

Refined guidance is needed for the selection of appropriate respiratory protective devices (RPD) for protection against infectious diseases. Current recommendations for respirators against infectious disease need to be updated. Responders need "user"-relevant adequate guidance on protection during operations in a pandemic environment.

### Performance Criteria and Standard for Underwater Operations Protective Clothing and Equipment

There is a specific need for this type of standard, particularly for underwater port security and

contaminated water diving operations. PP&OE supports the development of the proposed NFPA 1953 Standard for Protective Clothing and Equipment for Contaminated Water Operations.

### CBRN Respirator Selection, Use and Maintenance

The emergency responder community has a need for guidance and information on the selection, use, and maintenance of CBRN respirators to ultimately reduce incidences of respiratory related injury for nearly 4 million career and volunteer corrections, emergency medical services, fire fighting, and law enforcement responders.

## **Future and Continued Initiatives**

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- Continue to expand the PP&OE SubGroup's efforts in developing an all-hazards approach to its SEL topic matter.
- Ensure that the development of all standards relating to the performance and testing of PPE include mandatory requirements for independent third-party testing and certification of products and equipment.
- Support NIOSH with gathering respirator surveillance information and in development of respirator use guidance documents for emergency responders.
- Continue to advocate for PPE standards for the law enforcement community that maintain necessary hazards-based levels of CBRN protection while, at the same time, meeting their specific mission-related requirements for fit, form, and function. The NIJ Special Technical Committee is currently developing an NIJ Standard on CBRN Protective Ensembles for Law Enforcement.
- Continue to serve as the primary emergency response community advocate throughout the development of the proposed HSPD-22, National Strategy for Chemical Protective Equipment Research and Development in the United States.
- Advocate the development of improved PASS that incorporates wireless 3-D personal accountability and tracking capabilities.
- PP&OE believes that there is a need for body-worn environmental temperature and physiological status monitoring sensors to provide the responder, safety officer, and incident commander with the ability to proactively identify responder health risks.
- There is a need for respiratory protective equipment performance requirements and standards for use during firefighting overhaul operations. Research is required to establish guidelines for monitoring and decision making that would identify the critical combustion by-products and permissible levels as well as common hazards, together with specific criteria for transitioning from SCBA to APR or PAPR.
- Research is needed to determine the possibility for alternative respiratory protective equipment during wildland firefighting operations. Currently, no standards exist for respiratory protective equipment for use during wildland firefighting operations. Most wildland firefighting operations are conducted without any respiratory protective equipment or with equipment that is not tested or certified. Research and subsequent standards development are needed to offer protection to personnel without hindering their ability to effectively perform in such environments.
- Performance criteria are needed for firefighter emergency escape devices for use when SCBA breathing air is depleted. Several items are currently being sold that are not tested and certified for actual fire inhalation hazards. Proper breathing air management principles would dictate that personnel never place themselves into a position of low-air operations. However, lost or entrapped firefighters may have no option but to use such a emergency device. Therefore, a performance standard needs to be developed.
- Research and appropriate action are needed with regard to the personal protection and operational equipment needs for crop and animal disease outbreak emergency response.

- The IAB local/state responder members will support NIOSH in conducting a multi-phase program to conduct and develop 1) Evaluation Study – systematic collection and analysis of response and safety plans and training materials to identify strengths, weaknesses, and gaps and recommend information regarding CBRN respirator selection, use, and maintenance; 2) Health Communication Guidance – establish, disseminate, and evaluate guidance materials tailored to specific response organizations; and 3) Decision Logic Treatise – define, publish, and evaluate a CBRN RPD decision logic treatise addressing proper selection, use, and maintenance of NIOSH-approved CBRN respirators.



**Douglas E. Wolfe**

*Captain, Special Operations Coordinator  
Sarasota County (FL) Fire Department*

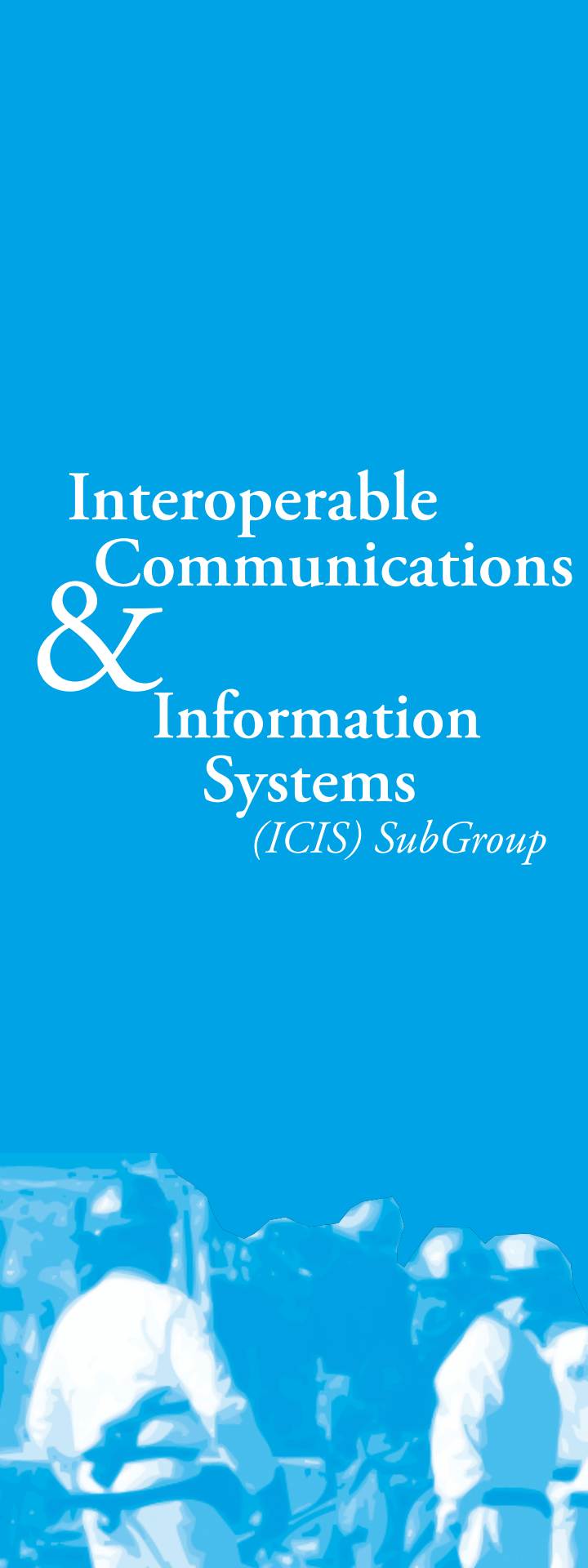
Douglas Wolfe has served in the hazardous materials emergency response field for 24 years with Sarasota County Fire Department and coordinates its Special Operations and Domestic Security programs. During his tenure in the field Douglas has instructed on a national basis for numerous organizations, including the National Fire Academy, where he has served as subject matter expert and co-authored numerous programs, including, “Advanced Life Support Response to Hazardous Materials Incidents,” “EMS: Special Operations,” “Emergency Response to Terrorism: Tactical Considerations,” and “Chemistry for Emergency Response.” In addition to the IAB, Douglas serves on the Florida SERC and Hazardous Materials Training Task Force as well as the Florida State Working Group for Domestic Security Equipment Subcommittee.



**William Haskell**

*National Institute for Occupational Safety and Health  
National Personal Protective Technology Laboratory  
Centers for Disease Control and Prevention*

Bill Haskell is a member for the Policy and Standards Development Branch at the NIOSH National Personal Protective Technology Laboratory (NPPTL). NPPTL was established in 2001 by congressional directive to provide world leadership for the prevention and reduction of occupational disease, injury, and death for workers who rely on personal protective technologies. The NPPTL Mission is to prevent work-related illness and injury by ensuring the development, certification, deployment, and use of PPE and fully integrated, intelligent ensembles. Mr. Haskell serves on the NFPA Technical Correlating Committee for Fire and Emergency Services Protective Clothing and Equipment and NFPA technical committees for hazard materials, electronic safety, structural/proximity, special operations, and emergency medical service protective clothing and equipment. Mr. Haskell is a member of the ASTM International F23 Protective Clothing and E54 Homeland Security Committees and the IACP Homeland Security Committee. Prior to joining NPPTL, he worked for 24 years at the Army Research Laboratory and the Army Soldier Systems Center. Mr. Haskell holds a B.S. in civil engineering and an M.S. in plastics engineering from the University of Massachusetts at Lowell.



# Interoperable & Communications Information Systems (ICIS) SubGroup

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## FEDERAL CO-CHAIR

**Mike Tuominen**  
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**Bob Tuohy**  
*Homeland Security Institute*

*Welcome to the ICIS SubGroup section of this year's annual IAB report. On behalf of the ICIS SubGroup, co-chairs Mike and Chris hope that you may find the information pertaining to communications-related technologies, software, processes, and more to be helpful and informative. After years of gaining momentum, we are pleased to affirm that there are now some significant national efforts under way to improve emergency incident communications. ICIS SubGroup members have been involved in many of these efforts.*

**The mission of the ICIS SubGroup is to identify and make recommendations on a model suite of practices, capabilities, applications, and equipment that provide for secure and assured communication and information systems.**

## **Roles and Functions**

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The primary means by which the ICIS SubGroup accomplishes its mission is through the quick, efficient, and beneficial exchange of information, whether voice or data (i.e., communications). In after-action reports for major incidents and drills throughout the nation, communications continues to be listed among the top “issues” needing more work. “Interoperability” (or “interoperable communications”) continues to be one of the most-used buzzwords in the realm of emergency response, on all levels.

Perhaps the greatest strength of the IAB is the emphasis on the practitioner—with the majority of the membership being current first responders from EMS, fire, and law enforcement agencies. The standards and equipment guides are developed by first responders, for first responders. In this work, “responder” members are fortunate to have the support and input from the rest of the membership—representatives from state/federal government, academia, industry, and others. While working with the other IAB SubGroups, the ICIS SubGroup’s role has always been one of developing a common or standardized operating picture for all the essential components of an emergency incident response. The unique quality of our effort is providing the information from the responder’s perspective.

The ICIS SubGroup acknowledges there are many other groups focusing on improving incident communications. While involved and participating in many of these other groups’ efforts, we believe it is our emphasis on the involvement of actual responders that makes the IAB and ICIS SubGroup unique. Others of these groups are tasked with developing long-term solutions. Some are developing wide-reaching solutions, and some are mission-specific or discipline-specific. Because of our ability to speak to the end-user’s perspective (“ground truthing”), members of the ICIS SubGroup provide expert advice and guidance to many of these other organizations.

Another significant difference between the ICIS SubGroup (and the IAB as a whole) and the numerous groups working to improve communications for the emergency responder community is that our membership eliminates the “middle man.” As mentioned previously, the ICIS SubGroup is able to put emergency responders (current Emergency Medical Technicians, firefighters, and law enforcement officers) in direct contact with those federal partners trying to provide assistance. It is this direct link that affords a timeliness and relevance that cannot be derived through meeting with delegates of

agencies/entities that represent still larger groups of first responders. It is sometimes said that, if you want to know what the needs and concerns of emergency responders are, you should talk to them! The IAB facilitates this dialogue.

The ICIS SubGroup continues to convey immediate, short-term communications-related needs from the responder community to the federal partners. Again, it is not our intent to circumvent representative agencies; in fact, many IAB members also participate in the representative organizations (IAFF, Association of Public Safety Communications Officials International [APCO], International Association of Fire Chiefs, IACP, etc.). This relationship serves to confirm or clarify to the federal partners those needs being expressed by the representative agencies.

The two-way information flow is beneficial to all involved. Through this process, our federal partners are able to rapidly obtain feedback essential to improving the safety and security of our nation. First responders are rewarded through the timely dissemination of information regarding such issues as grant programs, technology trends, resources, and ongoing research and development. It is our goal to provide yet another means to get information out to those who may not otherwise receive it.

The ICIS SubGroup continues to emphasize standardization of equipment and methods used for communications by first responders, focusing on several vital areas:

- CAD-to-CAD interfaces
- Records management systems (RMS)-to-RMS interfaces
- CAD-to-RMS interfaces
- Radio interoperability (P-25)
- Skills and training of communications support personnel (Communications Unit Leader, Communications Unit Technician, etc.)
- Cybersecurity
- Intelligence sharing and exchange

## Accomplishments

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Among our accomplishments continues to be the referral of current, knowledgeable public safety experts to other groups that are themselves making significant progress in communications-related endeavors (i.e., engaging the right people in the right efforts). In addition to the ongoing information exchange efforts (SEL maintenance, RKB-related work, etc.), our SubGroup continues to focus on several significant areas of work. Among them in 2008:

- The SubGroup continued working with various governmental and nongovernmental agencies to better define standards and criteria pertaining to those individuals responsible for supporting emergency incident communications.
- We continued our work with NIST on the roll-out of Project 25 standards.
- For CAD-to-CAD interfaces, our SubGroup has been involved in development of the emerging National Information Exchange Model (NIEM) framework currently being developed as a partnership between the Department of Justice and DHS.
- We continued efforts to improve the collection, analysis, and dissemination of intelligence/information related to public safety (EMS, fire, and law enforcement) agencies, further improving their collective ability to protect U.S. citizens efficiently and safely.



## **Communications Unit Leader**

Through a series of meetings, the ICIS SubGroup has been working with DHS (Office for Interoperability and Compatibility, Office of Emergency Communications, and FEMA), and other national organizations to standardize training and certification for emergency incident communications support personnel. The Communications Unit Leader (COML) is the first such position for which a training curriculum has been developed. The COML working group started with the wildland community's COML and began making modifications toward including other operating environments and other responder disciplines.

The group has completed development of a Type III, All-Hazards Communications Unit Leader Course. The course is transiting through FEMA's approval process for inclusion on the national list of approved/authorized courses for grant funds appropriations. The goal is to have the course, the exam, and the certification available to first responders via the Internet. Also in development are a train-the-trainer course for the COML class and a "COML Awareness" course. As of this writing, almost 400 students have begun training nationwide.

## **Project 25**

The ICIS SubGroup has been working with SAFECOM and NIST on the incorporation of finalized P-25 standards from the overall suite into the SEL and AEL. To assist responders with future purchases of P-25 compliant communications equipment, ICIS SubGroup members have been working with NIST on the development of a decision matrix tool. When completed, the tool will enable users to determine the applicable P-25 standards based on the equipment they are adding or wish to purchase.

## **CAD-to-CAD Interface**

Another area where ICIS SubGroup members have been active involves the exchange of emergency incident-related data between disparate computer systems. For some time, emergency responders have been trying to develop standards that would better enable their respective dispatching centers to exchange data-specific information. One such effort began as the APCO Project-36. About the same time, DHS sponsored the efforts of another group working on data exchange standards, the Organization for the Advancement of Structured Information Standards (OASIS), to expand the CAP standard to include additional emergency-related messages. The expanded standard became known as EDXL. This effort began before the NIEM, also sponsored by DHS.

NIEM started with the Global Justice XML Data Model (GJXDM) standard and then began adopting additional standards in an effort to provide an overarching message development process and common data model. Since then, NIEM has added the EDXL data elements to its data model, but issues have arisen out of the NIEM implementation of EDXL. Where EDXL has gone so far as to define "messages," NIEM focuses on the data model and allows implementation specific messages. This approach does not work well with other EDXL implementations.

While the GJXDM is close to being an accepted standard, EDXL and NIEM are continuing to evolve. The intent of NIEM was to provide core components that cross domains and adopt domain-specific standards for domain-specific elements and provide a common methodology for developing new interfaces and messages. ICIS SubGroup members continue to be involved in these efforts.

## **C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance)**

SubGroup member John Sullivan (Los Angeles County Sheriff Department) worked with the DHS S&T Directorate on an initiative to better manage real-time intelligence. The technology, called fourDscape®, will help responders and their commanders to quickly analyze situations, interact with people on the scene, and coordinate a response with a clearly defined mission. It is produced by



Balfour Technologies under a contract with DHS S&T's Small Business Innovation Research Program.

FourDscape helps manage a large number of cameras and sensors in a virtual, high-resolution, and four-dimensional (4-D) computer display (4-D includes the three traditional dimensions of space, plus the fourth dimension of time). Beyond a basic satellite map of an incident overlaid with data about the locations of buildings and streets, the technology allows the user to monitor cameras at the scene, watch video conferences with colleagues, and receive alerts to get both contextual and interactive updates. These updates can help a commander understand the totality of a situation—while remaining on-scene—and make tactical decisions. (Information provided by DHS, [www.homelandsecurity.org/snapshots/newsletter/2008-04\\_outlook.htm](http://www.homelandsecurity.org/snapshots/newsletter/2008-04_outlook.htm).)

### **Other Items of Importance**

This past year, the Chair of the IAB began an initiative to visit and address the strategic planning needs of the entire IAB. One of the SubGroup's members, Dr. Amy Donahue, has been participating as part of a small team that the Chair assembled to review the mission, vision, values, and strategic direction of the IAB with the goal of understanding how the IAB can sustain and enhance its relevance to DHS after the recent election. The group has also been investigating ways in which the IAB can ensure ongoing collaboration with and sponsorship from DHS while also maintaining the health and productivity of its collaboration with its other federal partners, DOD, NIOSH/NPPTL, and NIST/OLES.



### **Christopher Lombard**

*Lieutenant  
Seattle (WA) Fire Department*

Christopher Lombard is a lieutenant with the Seattle Fire Department. In addition to working both in the operations division and as an emergency dispatcher, he manages a variety of projects, including communications coordination for the department's specialty teams and liaison for the department's interoperability with other jurisdictions. His current responsibilities include coordinating the use of, designing the training on, and assisting with the maintenance of communications equipment and policies for special operations teams (including Marine Emergency Firefighting Team, Urban Search and Rescue, Metropolitan Medical Response Systems, EMS, etc.). Lt. Lombard has been in the Fire Service for 16 years and a member of the IAB and the ICIS SubGroup from its onset.

In addition to having testified before Congress, lectured at Dartmouth College, and served on a variety of national forum discussion panels relating to emergency responder communications issues, he continues to have a leadership role in the coordination of efforts to standardize the training and certification for those individuals responsible for managing emergency incident communications throughout the nation. He remains involved in active communications-related roles such as NFPA 1221 (the standards committee for Public Emergency Service Communication), SAFECOM's Emergency Response Committee, FEMA's USAR teams, and more.



### **Mike Tuominen**

*Telecommunications Specialist, Incident Communications  
Operations, National Interagency Fire Center, National  
Interagency Incident Communications Division*

Mike Tuominen has more than 20 years of experience in incident communications and functions at the national level as an operations specialist for all-risk incident communications involving both natural and human-caused disasters. During such incidents he functions as a Communications Technician, Communications Unit Leader, Communications Coordinator, Communications Duty Officer, or Technical Specialist. His duties include the management of all facets of emergency communications systems which use low-power VHF and UHF land mobile radio, HF radio, satellite radio, and telephone as well as frequencies, equipment, and personnel resources for areas involved in severe multiincident emergencies. He is also involved in training through the National Wildfire Coordinating Group for Incident Communications Technician S-258, Communications Unit Leader S-358, and Communications Coordinator and has been involved in the development of an all-risk Communications Unit Leader course. Some of his recent assignments include Hurricanes Katrina and Rita 2005; Southwest, Pacific Northwest, and Northern Rockies Fires 2005, 2006, and 2007; Florida/Georgia Fires 2007; and technical assistance to the Republic of Ghana 2005.

# Detection & Decontamination (D&D) SubGroup



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## CO-CHAIR

**Thomas Brandon**  
*Suffolk County (NY) Police Department*

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## FEDERAL CO-CHAIR

**Elaine Stewart-Craig**  
*Department of Defense, Research, Development and Engineering  
Command, Edgewood Chemical and Biological Center*

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## Membership

**Ed Bergamini**  
*Fire Department, City of New York (NY)*

**Charlie Brannon**  
*National Naval Medical Center*

**Steve Clendenin**  
*Massachusetts Department of Fire Services*

**Alim Fatah**  
*National Institute of Standards and Technology*

**Cheryl Gauthier**  
*Bioterrorism Response Laboratory, Massachusetts Department of  
Public Health*

**Mark Gutke**  
*Jefferson County (CO) Sheriff's Office Bomb Squad*

**Gene Ryan**  
*Chicago (IL) Fire Department*

**Jim Schwartz**  
*Arlington County (VA) Fire Department*

**Peter Stevenson**  
*United States Environmental Protection Agency*

**Wes Thomas**  
*Downers Grove (IL) Fire Department*

**Michael Walter**  
*Department of Defense, Joint Program Executive Office for Chemical  
and Biological Defense*

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## Subject Matter Experts

**Ed Bailor**  
*United States Capitol Police (Retired)*

**Thomas Groel**  
*Federal Bureau of Investigation, Hazardous Materials Response Unit*

**David Ladd**  
*Massachusetts Department of Fire Services*

**Andrzej Miziolek**  
*United States Army Research Laboratory*

**James Stewart**  
*National Institute of Standards and Technology Support Contractor*

**John Wilson**  
*44th Civil Support Team*

**The Detection and Decontamination SubGroup provides input, direction, standards, and information to first responders on equipment for sampling, detecting, identifying, quantifying, monitoring, and decontaminating WMD agent (chemical, biological, radiological, nuclear, and explosive) contamination throughout designated areas or at specific points and items that support detection activities.**

## Functions

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The D&D SubGroup is responsible for addressing equipment identification, interoperability, and standardization in three complex areas of detection and decontamination: CWAs (including 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 CBRNE incident.

## Goals

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- Facilitate the exchange of information between the first responder community, government agencies, and the private sector, including 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 in response to CBRNE incidents.
- Encourage government, military, and private agencies, as well as manufacturers, to sponsor and support priority research and development projects to satisfy local, state, and federal CBRNE incident response equipment requirements based on the realistic needs of the first responder community.
- Encourage the detection capabilities to support an all-hazard approach to emergency response.

### Decontamination

Chemical Warfare and Toxic Industrial Chemical Contamination Levels Study: Studies continue to be conducted at ECBC with support from NIST/OLES and the DHS S&T Directorate to provide real-life levels of contamination that may be experienced by victims or emergency response personnel in a chemical event. These chemical warfare contamination level studies use simulants and real dissemination devices to gather data on the amount and location of contamination. Reports continue to be published discussing the testing and modeling of the contamination a responder or victim may encounter in a chemical event, including “Biological Aerosol Hazard Assessments of Emergency Responders in Specific Scenarios,” “Hazards from a Terrorist Release of a Biological Agent in Ventilated Enclosures and from Chemical Warfare Agents and Toxic Industrial Chemicals in Selected Scenarios,” “Respiratory Hazard Analysis from Selected Toxic Industrial Chemicals (TICS) in Plausible Terrorism Scenarios,” and “Scenarios for Respirator Challenge Estimates Following Release of Toxic Industrial Chemicals (TICs) and Chemical Warfare Agents (CWAs) in Ventilated Enclosures.” The testing data and reports are being used as a basis to evaluate how much contamination may be expected to be on personnel as well as how much contamination may be on the scene that could be transferred to the responders or victims causing increased medical and decontamination problems.

Personal Decontamination System ASTM International Work Item Number 0WK16817, “Standard Specification for a Personnel Decontamination System to be Used During a CBRNE Event”: This work item, when finalized, will provide the equipment performance requirements for a personnel decontamination system to ensure that people passing through the system have been decontaminated to a level where they pose no further threat to themselves or the community. Also, the categorization of decontamination systems by the number of personal decontaminated per hour will be possible once the standard is adopted by ASTM International. The standard is now being revised based on the inputs received during the ASTM International balloting completed in December 2008 and from other SMEs.

Work Planned: Continue to fund, test, and evaluate the decontamination processes and the detection and identification equipment necessary to ensure and document the effectiveness of any decontamination system and to develop test methods for use within the ASTM International Work Item Number 0WK16817.

Decontamination Equipment Performance Standards: The following standards were published by ASTM on January 1, 2008: ASTM E2542-08, “Standard Specification for Portable Water Heaters Used at Personnel Decontamination Stations,” and ASTM E2543-08, “Standard Specification for Portable Air Heaters Used at Personnel Decontamination Stations and Shelters.”

### Biological Detection Standards and Technology

Several members of the IAB continue to contribute to the development of standards and technologies through other venues, such as the Stakeholders Panel on Agent Detection Assays (SPADA). This body is managed by the Association of Analytic Communities, a longstanding standards development organization, under contract with the DHS/S&T. The primary focus of this body is the development of standards for reliable bio-threat detection in automated and user (responder) interfaced equipment.

Through lessons learned in the SPADA, members presented a “town meeting” forum in Rockville, Maryland to a wide community of scientists, government officials, responders, and developers. The purpose of this town meeting was to put forth recommendations that would support DHS/S&T in setting its course to develop standards and requirements for the use of “qualified” technologies under a standards development process. The articles passed at this town meeting are as follows:

- Article #1. Should DHS expand its effort to coordinate the development of CBRNE detection technologies and devices? 78 in favor, none opposed. The motion passed.
- Article #2. Should DHS develop, in collaboration with other agencies, standardization organizations, and industry, a program to qualify detection technologies and devices by an independent third party and make this program available to the private sector as a best practice? Subarticle: Once the program is available, detection technologies and devices must be qualified prior to their purchase by grantees and federally regulated venues. 56 in favor, 32 opposed. The motion passed.
- Article #3. In cooperation with other agencies, should DHS lead the development of guidelines and standards that lead to the implementation of training, proficiency testing, and certification of the operator in the use of qualified detection technologies? 78 in favor, 1 opposed. The motion passed.
- Article #4. In cooperation with other agencies, should DHS lead the development of guidelines for standard operating practices, which shall include the appropriate use and operation of qualified detection technologies, as well as interpretation and response by the end user? 79 in favor, 1 opposed. The motion passed.
- Article #5. DHS, in cooperation with other agencies, should develop strategic guidance on standards for CBRNE detector technologies for use by relevant critical infrastructure sectors, key resources and others. 79 in favor, 0 opposed. The motion passed.

Members of the IAB also were asked to undertake the leadership of working groups to reexamine and put forth recommendations for the revision of ASTM E2458, “U.S. National Standard for Sampling Suspicious Powders.” This review was carried out by two working groups, responders and laboratories, and presented at the 3rd National Conference on Environmental Sampling for Bio-Threat Agents.

### **Chemical Detection Standards**

The “Standard Specification for the Chemical Warfare Vapor Detector (CWVD),” ASTM E2411-07, was published and is available through ASTM. This performance standard and its certification planning documentation are being used as a baseline for a TIC vapor detector work item. The draft TIC work item, WK 19351, has been submitted to the ASTM E54.01 subcommittee, Homeland Security Applications, CBRNE Sensors and Detectors. The selection of specific TICs and the associated civilian threat concentrations and response times will be finalized with the U.S. Army Center for Health Promotion and Preventative Medicine. As with ASTM E2411-07, test methods have been identified or will be developed for all requirements. A great deal of information is being leveraged from the test method and certification development efforts related to ASTM E2411-07, which will lead to a multifaceted certification process for certifying all future detection items.



### **Thomas R. Brandon**

*Deputy Inspector  
Suffolk County (NY) Police Department*

Thomas Brandon is a Deputy Inspector with the Suffolk County, New York Police Department. He is a 27-year veteran of law enforcement. He has 14 years in law enforcement special operations, including commanding the SWAT team and the bomb squad. He is a graduate of the U.S. Army/Federal Bureau of Investigation (FBI) Hazardous Devices School at Redstone Arsenal and was a member of the National Bomb Squad Commanders Advisory Board. He is also a 31-year veteran of the volunteer fire service, where he has been involved in training, hazardous materials response, and technical rescue. Mr. Brandon has a B.S. in criminal justice from St. John's University in New York and a J.D. from the St. John's University School of Law. He is admitted to practice law in New York as well as the U.S. Supreme Court. He is a graduate of the FBI National Academy's 182nd Session.



### **Elaine Stewart-Craig**

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

Elaine Stewart-Craig, a chemical engineer who has worked for ECBC for more than 25 years, is currently Special Projects Group Leader. She oversees multiple projects, including the development of chemical and biological standards for commercial equipment. This program, funded by DHS, is a joint effort between ECBC, NIOSH, and NIST. Ms. Stewart-Craig is member of the National Institute of Justice's working group developing a CBR personnel protective ensemble standard for the law enforcement community. Ms. Stewart-Craig has a B.S. in chemical engineering from the University of Virginia and an M.B.A. from Loyola College. She began her career in personnel protection equipment, designing and producing CB-protective masks and filters for the military, and has been involved with quality assurance, strategic planning, and future business development for ECBC. Ms. Stewart-Craig is a member of ASTM Committee E54, Homeland Security Applications, and has been involved in the area of homeland security/defense since 1995.





# Medical SubGroup (MSG)

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## CO-CHAIR

**Tom Walsh**  
*Mount Erie (WA) Fire Department*

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## FEDERAL CO-CHAIR

**Stephen Skowronski**  
*Centers for Disease Control and Prevention*

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## Membership

**Knox Address**  
*Louisiana State University Health Sciences Center – Shreveport*

**Sandy Bogucki**  
*Yale Emergency Medicine*

**Kelly Burkholder-Allen**  
*University of Toledo*

**Richard Burton**  
*Placer County (CA) Health and Human Services*

**Mark Gibbons**  
*Maryland State Police, Emergency Operation Section, Special Operations Command*

**Randy Griffin**  
*DeWitt (NY) Fire District*

**Earl Hall**  
*University of Montana, College of Health Professions and Bio-Medical Science*

**Karen House**  
*Department of Defense, Joint Project Manager Guardian*

**Susan Jones-Hard**  
*Centers for Homeland Defense and Security*

**Gregg Lord**  
*George Washington University*

**Paul Maniscalco**  
*National Association of Emergency Medical Technicians*

**Kenneth Miller**  
*Orange County (CA) Fire Authority*

**Bill Powers**  
*Department of Homeland Security, Office of Health Affairs*

**Jeff Race**  
*Haz Tac Operations, Fire Department City of New York, FDNY Training Academy*

**Lawrence Tan**  
*New Castle County (DE) Department of Public Safety, Emergency Medical Services*

**Jane Wixted**  
*Emergency Management, Cleveland Clinic, Cleveland, Ohio*

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## Subject Matter Experts

**Mike Gedert**  
*National Disaster Medical System, Disaster Mortuary Operational Response Team*

**Stephan Graham**  
*United States Army Center for Health Promotion and Preventive Medicine*

**Pamela Krahl**  
*United States Marine Corps, Chemical Biological Incident Response Force*

**Bob Shank**  
*National Disaster Medical System, Disaster Mortuary Operational Response Team*



**The mission of the Medical SubGroup 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 RKB 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**

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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 emergency medical systems, 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 SMEs for assistance with specific topics or areas of interest. SMEs occasionally participate in MSG meetings to expand the breadth of knowledge and resources available to the IAB as a whole.

## **Role and Functions**

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The MSG participates in all aspects of the IAB. Due to the diversity of the mission, which includes consideration for and understanding of the care of casualties as well as the health and safety needs of personnel participating in the management of the incident, information exchange with each of the other IAB SubGroups is essential. In December 2008, an MSG member attended the 3rd National Conference on Environmental Sampling and Detection. A report about the meeting was shared with the IAB. Specifically, the functions and roles of the MSG include the following:

- Participating in SCC meetings to represent medical, public health, and incident health and safety interests.
- Participating in S&T 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 RKB.
- Reviewing, improving, and updating other sections of the SEL and RKB 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 used in the medical management of victims of a CBRNE event are regulated by the U.S. Food and Drug Administration. Consequently, the compilation of equipment and pharmaceuticals in the medical portion of the SEL is commonly found in today's prehospital and clinical environments. However, the MSG also reviews and recommends for reference, formal adoption, or change other available performance standards, technical specifications, and standard guidance for SEL items.

Finally, the MSG recommends and supports efforts to provide equipment procurement guidance to public health and medical authorities that is compatible and interoperable with the DHS Master Equipment List, the RKB, and the SEL.

### **Accomplishments in 2008**

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Upon request from the IAB Chair, the MSG developed a white paper to explain why the MSG has chosen not to include anthrax vaccine in the SEL. This white paper has been posted to the IAB website ([www.iab.gov](http://www.iab.gov)).

The MSG added six new members in 2008.

### **Equipment/Supplies/Pharmaceuticals**

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Two new items were added to the pharmaceutical antibiotics/antivirals subsection in Section 9 – Medical of the SEL. In addition, the MSG worked with several SMEs, including two members of the NDMS Disaster Mortuary Operational Response Team, to add a new subsection of the Medical SEL for Mortuary Operations (equipment and supplies needed for mass fatality management).

### **Training**

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The Medical SubGroup continued adding information to a new field within the SEL titled “Training Requirements.”

### **Initiatives and Progress (2009 and Beyond)**

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- Continue work on the Mortuary Operations subsection in the SEL for mass fatality management equipment and supplies.
- Other possible white papers explaining MSG positions and/or concerns.
- Possible new mission and objectives if the IAB proceeds with a new organizational structure.



**Thomas Walsh**

*Mount Erie (WA) Fire Department*

Thomas Walsh serves as a volunteer firefighter/paramedic with the Mount Erie Fire Department. He retired as the Medical Services Officer in the Seattle Fire Department's EMS Division in 2008. He served the citizens of Seattle for over 35 years with assignments on engines and ladders and as a firefighter paramedic. He joined the MSG in 1998 shortly after its inception.



**Stephen Skowronski**

*Public Health Advisor  
Centers for Disease Control and Prevention*

Steve Skowronski's first career was in the U.S. Army, where he served as a chemical decontamination officer; an aeromedical evacuation rotary wing pilot; a medical plans, operations, and training officer; and a DOD medical liaison to federal health and medical support. He participated in numerous domestic and overseas exercises and operations, including military support to Cuban refugee relocations in 1980 and the response to Hurricane Bertha. Following his military career, Mr. Skowronski worked as the Department of Health and Human Services' Regional Emergency Coordinator in New York City and Boston. In 2000, he began working for the CDC National Pharmaceutical Stockpile Program (currently Strategic National Stockpile) before his current assignment with the National Center for Environmental Health, Division of Emergency and Environmental Health Services. Mr. Skowronski has been a member of the MSG since 1999.

# Training SubGroup (TSG)

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## CO-CHAIR

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

---

## FEDERAL CO-CHAIR

**Teresa Embrey**  
*Technical Support Working Group*

---

## Membership

**Ed Allen**  
*Seminole County (FL) Sheriff's Office*

**Christina Baxter**  
*Douglas County (GA) Fire Department*

**Michael Brandon**  
*Louisville (KY) Metro Police Department*

**Terrence Cloonan**  
*Centers for Disease Control and Prevention, National Institute  
for Occupational Safety and Health, National Personal Protective  
Technology Laboratory*

**Ed Dadosky**  
*Cincinnati (OH) Fire Department, Homeland Security*

**John Ferris**  
*United States Occupational Safety and Health Administration*

**Jay Hagen**  
*Seattle (WA) Fire Department, Department of Homeland Security,  
Office of Grants and Training, Senior Fellow Practitioner*

**Kevin Johnson**  
*Federal Bureau of Investigation, Hazardous Materials Response Unit*

**Anthony Mussorfiti**  
*Fire Department, City of New York (NY)*

**Gregory Noll**  
*South Central (PA) Counter-Terrorism Task Force*

**Ronald Olin**  
*Lawrence (KS) Police Department*

**Wes Rogers**  
*Fairfax County (VA) Fire and Rescue Department*

**Steve Souder**  
*Fairfax County (VA) Department of Public Safety Communications*

**Valentine D. Sworts**  
*State of Montana Judicial Branch*

**James Turner, III**  
*Delaware Emergency Management Agency*

**Cindy Vanner**  
*Bioterrorism Response and Special Pathogens Laboratory, Rhode Island  
Department of Health*

**Roy Waugh**  
*Snohomish County (WA) Fire District #7*

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## Subject Matter Experts

**Barbara Wisniewski Biehn**  
*United States Central Command, J5, Combating Weapons of Mass  
Destruction Division, Cooperative Defense Branch*

**Joel Leson**  
*International Association of Chiefs of Police*

**Major J. Clay McGuyer**  
*National Guard Bureau – J3*



**The mission of the Training SubGroup is to improve responder mission performance by conducting a cross-disciplinary review of, and providing end user input on, training doctrine, standards, and guidance developed for the responder community.**

## **Membership**

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The TSG consists of representatives from local, state, and federal responder agencies and institutions engaged in responder training. A goal of the SubGroup is to engage all of the response disciplines as defined by DHS/FEMA's National Preparedness Directorate. The TSG also draws upon a wide range of SMEs, both within and outside the IAB.

## **Roles and Functions**

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- Identify performance improvement needs related to Emergency Support Functions (ESFs).
- Provide subject matter expertise to support the development of training and exercise programs.
- Provide end-user guidance and operational lessons learned to support training and exercise program development and improvements.
- Facilitate the implementation of training and exercise programs and standards that support individual competencies and organizational capabilities.
- Advocate for standardized national guidance for responder and equipment training and exercises.

## **Initiatives and Progress**

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The IAB membership and federal partners recognize that, in addition to the core mission of recommending appropriate responder equipment and performance standards for their equipment, a crucial need exists to provide guidance on the training required to effectively and safely use the equipment. The basis for this guidance is to enhance preparedness capabilities and to improve responder performance and safety.

The following initiatives were addressed in 2008–2009:

- Provided feedback for refining the DHS Target Capabilities List.
- Reviewed and provided input to DHS capability-based Exercise Evaluation Guides (EEGs).  
The EEGs are designed to assist with exercise evaluation by providing evaluators with consistent,

operationally valid standards and guidelines for observation, data collection, analysis, and report writing.

- Categorized and updated training requirements for equipment included in the SEL to assist in equipment procurement by providing guidelines on operator proficiency.
- Identified the training required (federal, state, local, and tribal) to successfully tie performance of tasks to overall capability.
- Reviewed and provided input on improvements to capability-based training programs.
- Reviewed and provided input on training programs that strengthen the links between strategies, capabilities, and tasks.
- Refined the enhancement of the SEL to include training requirements for each SEL item. The following definitions were adopted:
  - Core training is defined as the fundamental baseline knowledge, skills, and abilities required for mission specific assignments. For example, an Emergency Medical Technician—Intermediate or Law Enforcement Patrol Officer.
  - Initial training is defined as the training required for a responder competent in a specialization to achieve competency-based knowledge, skills, and abilities beyond day-to-day duties. For example, competency-based training reflects the use of
    - new detection equipment by a certified HAZMAT technician and
    - specialized PPE employed by SWAT, EOD, or Crime Scene Technician.
  - Sustainment training is defined as training required to maintain competency-based knowledge, skills, and abilities.
- For each SEL item, identified core training required to operate the equipment and also categorized each item as having minimal, moderate, or extensive training requirements for initial and sustainment training.
- Began exploring modeling and simulation training technologies to identify viable, utilitarian applications with the intent to advocate for more effective selection and implementation approaches for the response community.
- Provided input to the SCC on the development, adoption, and implementation of appropriate and relevant training standards.

## Ongoing Commitments

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- Continue to be a national, interdisciplinary sounding board for training and exercise doctrine and programs. This task is essential in focusing funds and resources on relevant, operationally sound training and exercise programs.
- Continue to support development of the law enforcement PPE standards and training process, as requested by the NIJ.
- Continue to work with the respective IAB SubGroups to identify in each equipment category the minimal, moderate, or extensive training requirements based on initial and sustainment training required to operate the equipment.

## Priorities of 2009–2010

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- Provide input on the development, adoption, and implementation of appropriate and relevant training and exercise standards and requirements for the response community.

- Support NIJ in the development of the law enforcement PPE and training standards.
- Support all ESFs in the development of training standards, with an emphasis on matching training requirements to responder equipment.
- Review and provide input to improve the operational applicability of training and exercise doctrine and programs that impact the ESFs.
- Promote instructional systems design-based models such as analysis, design, development, implementation, and evaluation for training and exercises.

## Future Initiatives

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The process of providing advice on relevant and successful responder-focused training and exercise programs is an ongoing one, driven by threat, capability, technology, and personnel. The TSG will identify and prioritize training and exercise requirements based on these factors.

The TSG will work closely with all IAB SubGroups to identify standards where they exist and identify their application to individual competency-based and organizational capability-based training. Where standards do not exist, the SubGroup will advocate, through the IAB, for their establishment.

## Summary

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The TSG strongly recommends that any equipment purchased include identification of initial and sustainment requirements for competency-based training on the application, operation, and maintenance of the equipment.

The TSG recommends that organizations purchasing or developing training require that it adhere to the principles of instructional systems design and best practices for adult learning such as those demonstrated in the Responder Training Development Center (RTDC).

The TSG endorses the exercise cycle as cited in the Homeland Security Exercise Evaluation Program. Exercises serve to validate plans and training, and as such are a critical component in the cycle of preparedness.

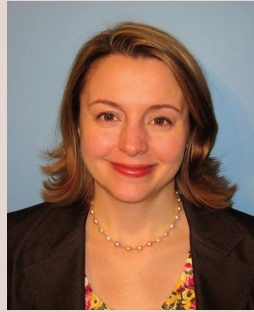




**Alan Dennis Vickery**

*Assistant Chief of Risk Management and Safety  
Seattle (WA) Fire Department*

A.D. Vickery, a 42-year veteran of the Seattle Fire Department, is currently the Assistant Chief of Risk Management and Safety, dealing with all aspects of the department in regards to risk management and safety, including fires, hazardous materials, emergency medical services, special operations, and homeland security. He was previously Deputy Chief of Special Operations, responsible for all operational issues for the department, as well as specialty teams: 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 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 first responders to safely perform their jobs using the latest technology available.



**Teresa A. Embrey**

*Program Manager, Training Technology Development  
Technical Support Working Group*

Teresa Embrey is a program manager for the Technical Support Working Group, providing management and technical oversight for the execution of training programs focused on supporting interagency combating terrorism training and education requirements. She is an advocate for high-quality training that supports the needs of the end user and integrates emerging threat information, effective instructional design best practices, and innovative educational technologies.

Prior to her role as a program manager, Mrs. Embrey supported the Chemical, Biological, Radiological, and Nuclear Countermeasures Subgroup at TSWG, where she managed a portfolio of biological and chemical research and development projects. She began her career with the Department of the Navy as a Budget Analyst performing payment accounting. Mrs. Embrey has a Master's of Education in Instructional Design and Development from George Mason University and has B.S. degrees in business administration and biology from the University of Mary Washington.



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- 1. Purpose.** The InterAgency Board (IAB) for Equipment Standardization and Interoperability is designed to establish and coordinate local, state, and federal standardization, interoperability, compatibility, and responder health and safety to prepare for, train and respond to, mitigate, and recover from any incident by identifying requirements for an all-hazards incident response with a special emphasis on Chemical, Biological, Radiological, Nuclear or Explosive (CBRNE) issues. An integrated suite of 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 support them, are needed to guide the efforts of the manufactures and equipment developers; and to serve as a guide for informed procurement decisions by the appropriate agencies. These standards are to support the needs of response organizations to include law enforcement, fire fighters, HAZMAT, emergency medical and other related agencies that consist of the first elements to respond to incidents or attacks, and also pertain to organizations that are involved in the mitigation and recovery phases of such attacks. This document describes the strategy and process to develop such an integrated standards suite.
  - 2. Objective.** The objective of this effort is to enhance public safety and health by defining requirements and identifying a set of standards 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. Additionally, we seek to facilitate the adoption of standards that can be used by local, state, and federal public safety and health communities. In order 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). 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.
  - 3. Standards Development Process.** The Office of Law Enforcement Standards (OLES) of the National Institute of Standards and Technology (NIST) serves as the executive agent for the SCC. OLES has developed an integrated process for guiding the development of standards to facilitate linkage to federally funded equipment grant programs for first responders. This DHS-endorsed process takes into account the need to integrate a conformity assessment program within the development process. This process is detail in Appendix 1 of this document.
  - 4. Organization and Responsibilities.** The IAB Committees and SubGroups are critical to development of the suite of standards.

    - The Standards Coordination Committee (SCC) has the primary lead for coordinating standards requirements and priorities for the IAB as outlined in the IAB charter. The equipment SubGroups identify functional requirements for equipment in their commodity areas, in close collaboration with the user community. They also identify and recommend to the SCC existing technical issues and standards for direct incorporation, standards that could be incorporated with modification, and new standards that need to be developed.
    - The Office of Law Enforcement Standards (OLES) at the National Institute of Standards and Technology (NIST) serves as the executive agent for the SCC and in accordance with this plan. OLES will:
      - Maintain a library of all IAB adopted standards.

- Provide the list of IAB adopted standards to the Department of Homeland Security (DHS), the National Institute of Justice (NIJ) and other appropriate agencies that may adopt these standards and link them to grants programs.
- Provide the list of IAB standards requirements and priorities to DHS, NIJ, and other appropriate organizations that may be in a position to support the development of such standards.
- Coordinate with appropriate agencies to ensure the standards development process as outlined in Appendix 1 is followed.

**5. Execution.** The Standards Suite will be developed, promulgated, and administered as outlined above. The work will be conducted during regularly scheduled meetings of the IAB, in specially convened SubGroup sessions, and by members of the SubGroups as directed by the SubGroup chairs.

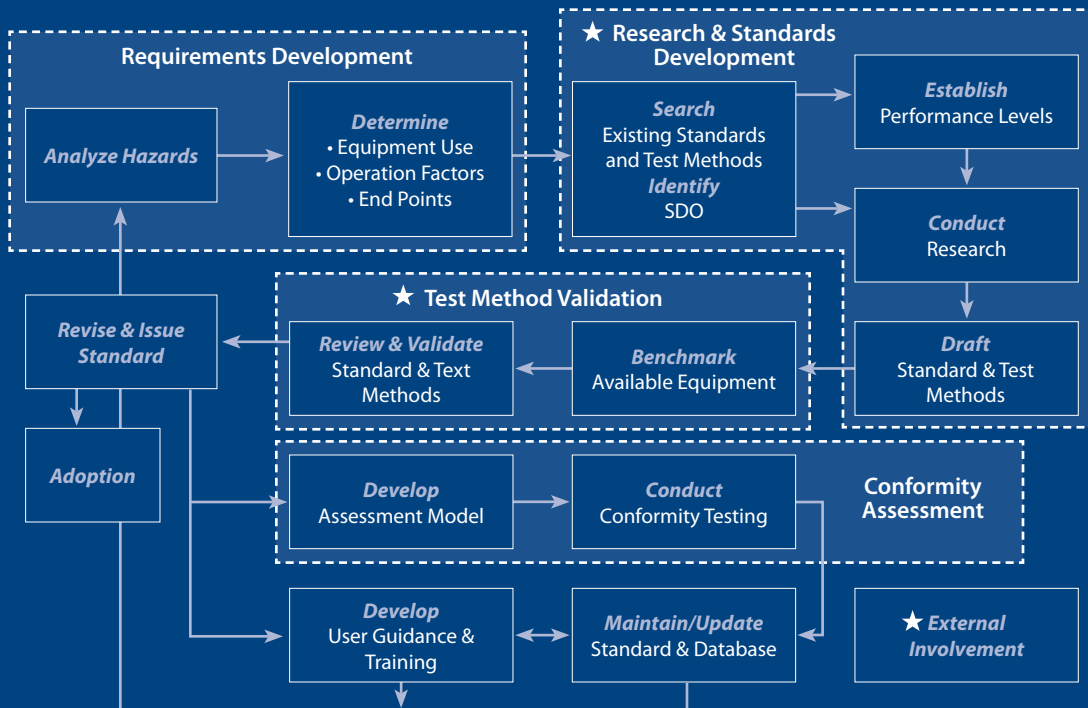
- *Adoption of Existing Standards* – Standards that require no modification will be added ‘as is’ to the Standards Suite. The adoption and inclusion of a standard into the Suite will follow the review and approval process as developed by the SCC. Cognizant SDOs will be notified. These standards will be disseminated to the state, local, and federal public safety and health communities and to manufacturers, developers, and the test-and-evaluation community.
- *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 for implementation. In cases where existing standards are not able to be modified to meet the specific needs of the IAB, then a new standard will be developed as required. 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.
- *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 appropriate sponsor agencies and/or SDOs for development. 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.
- *Methodology for Reviewing Standards* – A process will be put in place so that, on a biannual, periodic basis, the standards included in the 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 Standards Suite are updated, modified, revised, replaced, or superseded by the SDO.
- Recommendations for adoption, modification and adoption, as well as the identification of new standards to be developed will be documented.

## Appendix 1: Equipment Standards Suite Development Process

OLES, as the executive agent for the SCC and in over 30 years of developing standards for the criminal justice community, developed the following standard development process to ensure tie-in to federally funded equipment grant programs for first responders. This DHS-endorsed process takes

into account the need to integrate a conformity assessment program within the development process. The process has proven so effective that OLES and many of OLES's technical partners have adopted it to guide the development of standards not only for CBRNE equipment but also for other types of equipment standards. Some standards-development activities require following the entire process; others may be more limited in scope and may not require completion of the whole process, as illustrated in the figure below.

### Standards Development Process Management Model



**Requirements Development:** The first step is to develop the requirements for the standard. A threat and hazard analysis is used to determine the requirements of the user, what the responder needs the equipment to do, and under what conditions. In the analysis, a number of factors need to be addressed such as: What is the threat that is to be countered? What is the use of the technology? What environmental conditions need to be considered, e.g., temperature, humidity ranges to be considered, flame resistance, etc.? What key endpoints must be measured, e.g., is it detection of specific agents and at what range of concentrations? What operational considerations need to be addressed to ensure that equipment compliant to the standard will be suitable for the users' concept of operations?

**Research and Standards Development:** The next step is the development of the performance requirements and performance standard and appropriate test methods to evaluate the performance of the equipment to the standard. Maximum use is made of the voluntary consensus standards development process, the development and promulgation of the standards through recognized SDOs such as ASTM International, the American National Standards Institute (ANSI), AOAC International, the National Fire Protection Association, and other such organizations. A review of existing standards and test methods is conducted to identify 1) standards and test methods that meet the requirements as identified, or 2) standards and test methods that if modified could meet the requirement, or 3) if no such standards and test methods exist, then identify the appropriate SDO for development and promulgation of the new standard and initiate the development of the standard through the SDO. In some cases supporting research must be conducted as part of the standards development process to provide technical support in the development of the standard or supporting test methods. The result of this phase is draft performance standard and supporting test methods.

**Test Method Validation:** Once the draft standard and test methods have been drafted, the next step is to procure commercially available products and test them to the draft standard. This process validates the test methods, verifying that the test methods can be translated to standard operation procedures that qualified laboratories can use and implement, and it benchmarks currently available equipment. If no benchmarked equipment meets the standard, then the standard must be closely scrutinized. If, however, the preliminary benchmarking indicates that no equipment can meet the standard, even with modifications by the manufacturer, then the performance standards and the test methods must be reevaluated. Decisions must be made whether or not to revise the standards and test methods based on the results of the initial benchmark testing without sacrificing health and safety requirements or to maintain the standards as drafted.

**Revise and Issue Standard:** After identifying and resolving all concerns, the standard is issued or promulgated by the appropriate SDO. One key component of this program is the adoption of these standards by the appropriate agencies. This includes the IAB, the Department of Homeland Security, or adopting by local jurisdictions or other organizations. Adoption by DHS or other agencies serves to tie compliance to appropriate standards with the federal grants programs, in compliance with Homeland Security Presidential Directive (HSPD) & (National Preparedness).

**Conformity Assessment:** The development of performance standards and test methods to evaluate performance to these standards does not ensure that the equipment going to the responders does indeed meet these standards. Programs must be put in place to use the test methods to evaluate conformity to the appropriate standards. The details of these conformity assessment programs will vary, depending on the type of technology being evaluated, the consequence of non-conformance to the standard, whether the standard promulgated by a particular SDO contains provisions for conformity assessment and a number of other factors. In some cases appropriate third-party test facilities must be identified that satisfactorily conduct the testing, and the appropriate test management and certification program must be established.

**Develop User Guidance and Training:** The standards and associated test methods by necessity are very specific and technical documents. The capabilities and limitations on the performance of the technology must be translated in terms that are understandable and useable by the end users of the equipment. They must know whether the system has been tested against Toxic Industrial Chemicals/Materials (TIC/TIMs) or just against Chemical Warfare Agents. Development and distribution of this type of information is essential for the user, the procurement official, and in the development of concepts of operation and training programs. Training programs and concepts of operations (CONOPS) must be adapted or developed to effectively use and understand the capabilities of technologies that meet these standards.

**Maintenance of Standard:** There must be provisions for the review and update of the standard. As experience is gained in the use of the standard, as new technologies and test methods become available, or in the case of unforeseen problems with the standard and test method, the standard will require periodic revisions. Most SDOs have procedures to accomplish these tasks, and this will be one of the considerations in selecting the appropriate SDO for the development and promulgation of any new standard. A list of compliant equipment must be maintained and available for the user community. One such portal is the DHS-funded Responder Knowledge Base. As Executive Agent for the SCC, OLES will maintain a library of the IAB adopted standards. This also includes addressing standards that are withdrawn by the parent SDO.

**External Involvement:** This process is not conducted in a vacuum. Involvement from external agencies and public comment from users, developers, manufacturers, and other concerned individuals and organizations are critical in the development of the standards. There are a number of points within the process where such comment will be actively solicited. Each SDO has its own method for addressing and incorporating public comment in its standards process.

## Acronym List

<b>AEL</b>	Authorized Equipment List
<b>ANSI</b>	American National Standards Institute
<b>AOAC</b>	Association of Analytical Communities
<b>APCO</b>	Association of Public-Safety Communications Officials–International, Inc
<b>APR</b>	air-purifying respirator
<b>ATSD(NCB)</b>	Assistant to the Secretary of Defense (for Nuclear and Chemical and Biological Defense Programs)
<b>CAD</b>	computer-aided dispatch(ing)
<b>CAP</b>	Common Alerting Protocol
<b>CB</b>	chemical and biological
<b>CBDP</b>	Chemical Biological Defense Program
<b>CBRN</b>	chemical, biological, radiological, nuclear
<b>CBRNE</b>	chemical, biological, radiological, nuclear, and explosive
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CFR</b>	Code of Federal Regulations
<b>CIC</b>	Compatibility and Interoperability Committee
<b>CID</b>	(DHS) Command, Control and Interoperability Division
<b>COML</b>	Communications Unit Leader
<b>CWA</b>	chemical warfare agent
<b>D&amp;D</b>	detection and decontamination
<b>DHS</b>	Department of Homeland Security
<b>DOD</b>	Department of Defense
<b>DOE</b>	Department of Energy
<b>ECBC</b>	Edgewood Chemical Biological Center
<b>EDXL</b>	Emergency Data Exchange Language
<b>EEG</b>	Exercise Evaluation Guide
<b>EMS</b>	Emergency Medical Services
<b>EPA</b>	Environmental Protection Agency
<b>ESF</b>	Emergency Support Function
<b>FACC</b>	Federal Agency Coordinating Committee
<b>FDNY</b>	New York City Fire Department
<b>FEMA</b>	Federal Emergency Management Agency
<b>GJXDM</b>	Global Justice XML Data Model
<b>HAZMAT</b>	hazardous materials
<b>HSPD</b>	Homeland Security Presidential Directive
<b>HVAC</b>	heating, ventilation, and air conditioning
<b>IAB</b>	InterAgency Board
<b>IACP</b>	International Association of Chiefs of Police
<b>IAFF</b>	International Association of Fire Fighters



## Acronym List - *Continued*

<b>ICIS</b>	interoperable communications and information systems
<b>IDHL</b>	immediately dangerous to life or health
<b>IED</b>	improvised explosive device
<b>IND</b>	improvised nuclear device
<b>ISO</b>	International Organization for Standardization
<b>JPEO-CBD</b>	Joint Program Executive Office for Chemical and Biological Defense
<b>MSG</b>	Medical SubGroup
<b>NFPA</b>	National Fire Protection Association
<b>NIEM</b>	National Information Exchange Model
<b>NIJ</b>	National Institute of Justice
<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>NIST</b>	National Institute of Standards and Technology
<b>NPD</b>	National Preparedness Directorate
<b>NPPTL</b>	National Personal Protective Technology Laboratory
<b>OASIS</b>	Organization for the Advancement of Structured Information Standards
<b>OLES</b>	Office of Law Enforcement Standards
<b>OSHA</b>	Occupational Safety and Health Administration
<b>PAPR</b>	powered air-purifying respirator
<b>PASS</b>	personal alert safety system
<b>PCR</b>	polymerase chain reaction
<b>PPE</b>	personal protective equipment
<b>PP&amp;OE</b>	Personal Protective and Operational Equipment SubGroup
<b>PPT</b>	personal protective technology
<b>R&amp;D</b>	research and development
<b>RDD</b>	radiological dispersal device
<b>RDECOM</b>	Research, Development and Engineering Command
<b>RDT&amp;E</b>	research, development, test, and evaluation
<b>RF</b>	radio frequency
<b>RFID</b>	radio frequency identification
<b>RKB</b>	Responder Knowledge Base
<b>RMS</b>	record management system
<b>RPD</b>	respiratory protective device
<b>SCBA</b>	self-contained breathing apparatus
<b>SCC</b>	Standards Coordination Committee
<b>SDO</b>	standards development organization
<b>SEL</b>	Standardized Equipment List
<b>SME</b>	subject matter expert
<b>SPADA</b>	Stakeholders Panel on Agent Detection Assays
<b>S&amp;T</b>	science and technology



## Acronym List - *Continued*

<b>SWAT</b>	special weapons and tactics
<b>TIC</b>	toxic industrial chemical
<b>TIM</b>	toxic industrial material
<b>TRL</b>	technology readiness level
<b>TSG</b>	Training SubGroup
<b>TSWG</b>	Technical Support Working Group
<b>USAR</b>	urban search and rescue
<b>WMD</b>	weapon of mass destruction
<b>WUI</b>	wildland/urban interface