The ODP/OLES 5-Year Plan for CBRNE Standards

Kathleen Higgins
Director
Office of Law Enforcement Standards
National Institute of Standards and Technology
5-Year Plan
equipment performance standards

When?

user guides
Standards Coordination Committee

Establish performance standards and equipment testing programs for critical equipment
Establish performance standards and equipment testing programs for critical equipment.
Standards and Technology Directorate

U.S. Department of Homeland Security

Standards and Technology Directorate
STANDARDS
CBRNE Equipment Standards Development Process

Hazards/Vulnerability Assessment

- Analyze Hazards
  - Determine Exposure Limits (PPE)
  - Determine Airborne Monitoring Values (Detectors)

Standards Development

- Search Existing Standards and Test Methods
- Establish Equipment Performance Levels
- Draft Test Methods & Standard

Test Method Validation

- Review & Validate Standard & Test Methods
- Test Available Equipment
- Conduct Compliance Testing
- Establish Lab Certification Pgm.

3rd Party Compliance Testing Program

- Develop User Selection Guides

Maintain/Update Standard & Database

Public Comment
CBRNE Equipment Standards Development Process

Hazards/Vulnerability Assessment

- Analyze Hazards
- Determine Exposure Limits (PPE) / Airborne Monitoring Values

Standards Development

- Search Existing Standards and Test Methods
- Establish Equipment Performance Levels
- Draft Test Methods & Standard

- 3rd Party Compliance Testing Program
- Public Comment

- Lab Certification Program
- 3rd Party Testing
- Develop User Selection Guides

- Maintain/Update Standard & Database
- Revise & Issue Standard
- Conduct Compliance Testing
- Analyze Hazards

INFECTIONOUS SUBSTANCE
Standards Coordination Committee
Early Achievements

✔ Threat/Hazard Assessments
✔ WMD Computer Simulations
✔ Reviews of Existing Standards
✔ Ongoing Consultation with Researchers, Manufacturers, Technical Experts and First Responders
Standards Coordination Committee
Crucial Next Step

Prioritize
First Responder Needs
CBRN SCBA Standard Certification Testing

MINE SAFETY APPLIANCES COMPANY (MSA)
- TC-13F-475CBRN Custom 4500 MMR Xtreme CBRN Air Mask with FireHawk Regulator
- TC-13F-476CBRN Custom 4500 MMR Xtreme CBRN Air Mask with FireHawk Regulator
- TC-13F-474CBRN Custom 4500 MMR Xtreme CBRN Air Mask with FireHawk Regulator
- TC-13F-473CBRN Ultralite MMR Xtreme CBRN Air Mask with FireHawk Regulator

INTERSPIRO, USA
- TC-13F-133CBRN Spiromatic 4530 and Spiromatic S3 4530
- TC-13F-213CBRN Spiromatic 6630 and Spiromatic S3 6630
- TC-13F-197CBRN Spiromatic 9030 and Spiromatic S3 9030
- TC-13F-375CBRN Spirotek S3 4530
- TC-13F-420CBRN Spirotek S3 6630
- TC-13F-421CBRN Spirotek S3 9030

SCOTT HEALTH and SAFETY
- TC-13F-76CBRN Air-Pak 4.5
- TC-13F-212CBRN Air-Pak 4.5
- TC-13F-96CBRN Air-Pak 4.5
Supports SEL Development
Funds IAB
Adopted 5-Year Plan to Guide IAB Standards Program

Committed to Funding Plan; $15M Already Allocated
5-Year Plan

- Minimum Performance Standards
- SCAM Guides
- Certification/Compliance Testing
- Technical Support
5-Year Plan
Programs by Equipment Functions

Personal Protection Equipment (PPE)

Detection Equipment

Decontamination Equipment & Procedures
Personal Protection Equipment (PPE)

Lead Agency for Respirator Standards
Chemical & Biological Detection Equipment

- Establish Certification and Testing Standards
- Investigate Usefulness of Commercial Technologies
- Challenge devices with possible interferants
How Clean is Safe?

Acceptable Residual Contamination?

Safe Airborne Monitoring Values?

Establish Certification and Testing Standards

Chemical & Biological Decontamination Equipment & Procedures
CBRNE

Radiological
Materials dispersed by conventional explosive or attack

Nuclear
Detonation of Nuclear Yield Device
CBRNE
PPE, Detection & Decontamination Equipment
Protection from Radioactive Materials, Not Radiation
CBRNE
PPE, Detection & Decontamination Equipment

Emphasis: Information & Training

U.S. Department of Homeland Security
Standards and Technology Directorate

Office for Domestic Preparedness
CBRNE
Explosives
Pipe Bomb
### Web-Based Versions

### Updated Info

### Results of Certification/Compliance Testing

---

**National Institute of Justice**

*Law Enforcement and Corrections Standards and Testing Program*

---

### Table 5-3: Handheld Portable Detection Equipment (CA)

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Class</th>
<th>Chemical Agent</th>
<th>Agent Identifier</th>
<th>Detection Time</th>
<th>Classification</th>
<th>Duty Span</th>
<th>Cautions</th>
<th>Readout</th>
<th>Relay</th>
<th>Prt</th>
<th>NV</th>
<th>Pwr</th>
<th>Constr.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### 3.3.5 High Performance Liquid Chromatography (HPLC)

High performance liquid chromatography is most useful in the detection and identification of larger molecular weight chemical agents such as BZ or LSD, and in the detection and identification of biological agents. With HPLC, these compounds that do not easily volatilize can be analyzed without undergoing chemical derivatization. HPLC instrumentation is available from a variety of vendors such as Hewlett Packard, Perkin-Elmer, Shimadzu, and Varian, and is shown in Figures 3-15, 3-16, 3-17, and 3-18. As with GCs, HPLC instruments can be equipped with a variety of detectors such as ultraviolet-visible (UV-Vis) spectrometers, mass spectrometers, fluorescence spectrometers, and electrochemical detectors. Two limitations to the fielding of HPLCs and their detectors are the need for power requirements (120V house current) and high purity solvents. Currently there is no portable HPLC unit available.
When?
5-Year Plan – FY03

CBRN Respirator Standards
- Air Purifying Respirator
- Self Contained Self Rescuer
- Escape Hood

Radiation Detector Standards
- Radiation Hand-held
- Radiation Personal Alarming
- Radiation Portal Monitors
- Radiation Hand-held Detection
  Isotope Identification
CBRNE Equipment Standards Development Process

Hazards/Vulnerability Assessment

- Analyze Hazards
  - Determine Exposure Limits (PPE)
    - Airborne Monitoring Values (Detectors)

Standards Development

- Search Existing Standards and Test Methods
- Establish Equipment Performance Levels
- Draft Test Methods & Standard

Test Method Validation

- Test Available Equipment
- Review & Validate Standard & Test Methods
  - Develop User Selection Guides

- Conduct Compliance Testing
  - 3rd Party Compliance Testing Program
  - Establish Lab Certification Pgm.

- Maintain/Update Standard & Database
- Revise & Issue Standard
- Public Comment
5-Year Plan – FY04 (Projected)

- **Respirators**
  - Powered Air Purifying Respirators (PAPR)

- **PPE**
  - Chemical/Bio Hot Zone Ensemble

- **Detectors**
  - Chemical Point Detector
  - Radiation Second Generation Isotope Identifiers

- **Calibration System**
  For Devices that Measure Fit of Respiratory Equipment

- **Simulants**
  For Chemical and Biological Agents

- **Revised User Guides**
  - Biological Detection Equipment
  - Chemical Detection Equipment
5-Year Plan – FY05 (Projected)

**Respirators**
- Combined SCBA/APR
- Closed Circuit Self-Contained Breathing Apparatus

**PPE**
- Chemical Warm Zone Ensemble
- Particulate/Biological Threat Ensemble
- CBR Law Enforcement PPE

**Bomb Suits**
- Bomb Suit - Heavy

**Detectors**
- Chemical Colormetric
- Biological Assay
- Explosives – Standard Reference Materials (SRMs)

**Revised User Guides**
- Radiation Detection Equipment
- Explosives Detection Equipment
5-Year Plan – FY06 (Projected)

Respirators
✓ Supplied Air Respirator
PPE
✓ CBR Fire Fighter PPE
✓ CBR Medical PPE
Bomb Suit
✓ Recon/Light
Detectors
✓ Chemical Analytical Instrument
✓ Chemical Sorbent Sampling
✓ Biological Point Detector
✓ Trace Explosives
✓ 2X Standard Reference Materials (SRMs)

Explosives
✓ Explosive Mediation Equipment

Decontamination
✓ Solutions

Interoperable Communications
✓ CBRNE Communications Interface - PPE
✓ Position Location Reporting

Revised User Guides
➢ PPE
➢ Communications Equipment
➢ Decontamination Equipment
5-Year Plan – FY07 (Projected)

Detectors
- Chemical/Biological Continuous Monitoring
- Bulk Explosives
- Neutron Radiation

Explosives
- 2x Explosive Mediation Equipment

Decontamination
- Decontamination Equipment

Revised User Guides
- Chemical Detection Equipment
- Biological Detection Equipment
- Radiation Detection Equipment
## 5-Year Plan - Projections by Fiscal Year

<table>
<thead>
<tr>
<th>STANDARDS</th>
<th>FY03</th>
<th>FY04</th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respirator Standards</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Personal Protective Equipment</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Bomb Suit</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Chemical Detection</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Biological Detection</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Radiation Detection</td>
<td>4</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Explosive Detection</td>
<td></td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Explosive Device Mediation</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Chem/Bio Decontamination</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>PPE Comm Interface</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Position Location</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Standards</strong></td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td><strong>EQUIPMENT GUIDES</strong></td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
Beyond the 5-Year Plan . . .

New Technologies
New Products
New Threats

Need for CBRNE Equipment Standards will continue
CBRNE Equipment Standards Development Process

**Hazards/Vulnerability Assessment**
- Analyze Hazards
- Determine Exposure Limits (PPE)
- Analyze Airborne Monitoring Values (Detectors)
- Search Existing Standards and Test Methods

**Standards Development**
- Establish Equipment Performance Levels
- Test Available Equipment
- Search Existing Standards and Test Methods
- Review & Validate Standard & Test Methods
- Draft Test Methods & Standard

**Test Method Validation**
- Test Available Equipment
- Draft Test Methods & Standard
- Establish Equipment Performance Levels
- Establish Lab Certification Pgm.

**3rd Party Compliance Testing Program**
- Conduct Compliance Testing
- Maintain/Update Standard & Database
- Revise & Issue Standard
- Conduct Compliance Testing
- Review & Validate Standard & Test Methods

**Determine Exposure Limits (PPE)**
- Airborne Monitoring Values (Detectors)

**Develop User Selection Guide**
- Analyze Hazards
- Analyze Hazards
Anticipated Benefits of CBRNE Standards Development

- Greater Safety for First Responders
- More Effective Technologies
- Raise Performance Bar for the Industry
50,000+

Emergency Response Organizations

When products must *comply* with standards just to compete, the competitive edge will go to those that *exceed* the standards.
The ODP/OLES 5-Year Plan for CBRNE Standards...

...a foundation to build on