

# *National Personal Protective Technology Laboratory*

## **DoD Request for Modification of the CBRN APR Statement of Standard to Permit an Alternative to the Single Standard 40 mm Screw Mounted Canister**

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*Policy and Standards Development Branch*

*August 20, 2008*

# *Presentation Topics*

- **NIOSH Statutory/Regulatory Authority**
- **Development of NIOSH CBRN Air-Purifying Respirator Standards**
- **DoD Request For Alternative Connector Design**
- **Stakeholder Input**

# *Statutory/Regulatory Authority for NIOSH to Issue Respiratory Protective Device Approvals*

- Authority for NIOSH to approve respiratory protective devices is derived from the Federal Mine Safety and Health Act of 1977 and Occupational Safety and Health Act of 1970 - *Authority*
- Department of Labor; Occupational Safety and Health Administration (OSHA); 29 CFR Parts 1910. 132-138 requires employers to provide respirators certified by NIOSH under Title 42 Code of Federal Regulation (CFR) Part 84 – Respiratory Protective Devices - *Statutory/Regulatory*
- To date, all existing NIOSH Respiratory Protective Device Standards for Protection against CBRN hazards were developed by Policy - *Authority 42 CFR 84.63(c), 84.110 or 84.190*
- Future Respirator Standards will be developed by Informal Rulemaking processes to *Change 42 CFR 84*, including CBRN Standards for Supplied Air Respirator (SAR), Closed-Circuit Self-Contained Breathing Apparatus (CC-SCBA) and Combination Units

# *Development of NIOSH CBRN Air-Purifying Respirator Standards*

- **Because of their experiences in responding to the terrorist events of 2001, emergency responders identified the need for the interoperability of canisters and facepieces as a respirator user issue that NIOSH needed to address**
- **During the evolution of the CBRN statement of standard, NIOSH identified a single mechanical connector design requirement to support interchangeability of CBRN certified canisters and masks**
- **The user community strongly encouraged requiring interoperable capability at all three public meetings held that discussed the requirements for the CBRN APR**
- **Interoperability was strongly recommended in the 2002 Rand Report entitled, “Protecting Emergency Responders Lessons Learned From Terrorist Attacks”**

# *Development of NIOSH CBRN Air-Purifying Respirator Standards*

## *Hazards from a CBRN Terrorism Event*

- **Respiratory Hazards for First Responders (Law Enforcement, Fire, EMT and others) / First Receivers (Medical Community) were not well defined**
- **Potential Hazards include Chemical, Biological, Radiological and Nuclear (CBRN) materials:**
  - Chemicals include Toxic Industrial Chemical (TICs) and Traditional Military Chemical Warfare Agents (CWA)
- **Thousands of CBRN materials with different toxicities, quantities and physical and chemical properties that are a challenge for respiratory protection mechanisms**
- **Concentrations of the CBRN agent are not characterized at the terrorist site:**
  - May lack detection equipment for characterization
  - Toxicity data for CBRN agents are unknown
- **There is no known carbon that can absorb/adsorb every chemical**

# *Hazard Analysis and Selection*

- **Various chemical data lists were analyzed, including lists from the EPA, ATSDR, NFPA 1994, U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) Technical Guide 244, and classified sources**
- **A hazard analysis was performed that identified the most likely CBRN agents and estimated contaminant concentration profiles for likely CBRN Terrorist venues with two CWA (GB and HD) and several TICs**
- **In an effort to reduce the number of certification tests necessary for the CBRN standard, 139 respiratory hazards were selected then categorized into families**
- **Biological and radiological agents are addressed as part of the particulate agent family and requires P-100 media**

# *CBRN Agent Breakdown by Hazard Family*

<b>61</b>	<b>Organic vapor family</b> - with vapor pressures less than that of the compound <i>cyclohexane</i> -includes GB/VX
<b>32</b>	<b>Acid gas family</b>
<b>4</b>	<b>Base gas family</b>
<b>4</b>	<b>Hydride family</b>
<b>5</b>	<b>Nitrogen oxide family</b>
<b>1</b>	<b>Formaldehyde family</b>
<b>3</b>	<b>Particulate family</b>
<b>16</b>	<b>Radiological Agents</b>
<b>13</b>	<b>Biological</b>
<b>TOTAL:</b>	<b>139 CBRN Agents</b>

# *CBRN APR Performance*

- **Multi-protection system as requested by emergency response community**
- **Gas Testing Results on individual family members indicate that the CBRN APR canisters perform as intended**
- **Multiple Manufacturers have Multiple Models of CBRN APRs Certified to the NIOSH CBRN Statement of Standard**

## *DoD Instruction 6055.1*

- **DoD Instruction 6055.1 indicates that in non-military unique workplaces where OSHA standards or other Federal safety standards apply but do not cover, or only partially cover, existing conditions, the DoD Components shall use appropriate national safety and occupational health consensus standards under Public Law 104-113**
- **When there is no relevant OSHA or national consensus standard, the DoD Components may develop other protective measures to ensure the safety and health of DoD personnel**
- **DoD Components may prescribe more stringent exposure limits or monitoring frequencies than those in the basic OSHA standards**

# DoD Request For Alternative Connector Design



REPLY TO  
ATTENTION OF

Mr. Leslie Boord  
National Institute for Occupational Safety and Health,  
National Personal Protective Technology Laboratory  
P.O. Box 18070  
626 Cochran's Mill Road  
Pittsburgh, Pennsylvania 15236-0070

Dear Mr. Boord:

We request modification of your Statement of Standard for a Chemical, Biological, Radiological, and Nuclear Full Facepiece Air Purifying Respirator to permit an alternative to the single international standard 40 mm screw mounted canister for the Department of Defense (DoD). The new DoD Joint Service General Purpose Mask (JSGPM) has a bayonet mounted dual filter design that meets Warfighter requirements for a low profile protective mask with filters that can be changed out in a contaminated environment and which offer minimum breathing resistance. In all other respects the JSGPM meets the Statement of Standard.

National Institute for Occupational Safety and Health (NIOSH) certification of the JSGPM is essential for military-civilian integration in direct support of the DoD Homeland Defense mission. Modification of the standard will allow DoD first responders to use the JSGPM for respiratory protection on military installations in the Continental United States or when called upon to support civil authorities.

The technical point of contact for this matter is Mr. William M. Fritch, (410) 436-6652, or email [william.fritch@us.army.mil](mailto:william.fritch@us.army.mil). He will provide all data necessary to demonstrate that the JSGPM meets NIOSH performance standards.

Sincerely,

Stephen V. Reeves  
Major General, United States Army  
Joint Program Executive Officer  
for Chemical and Biological Defense

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Joint Project Manager for Individual Protection

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# *DoD Request For Alternative Connector Design*

- **The DoD request is to supplement the existing NIOSH standard with an alternate permissible design for DoD applications**
- **DoD requirements for the JSGPM require availability of replacement filters in the mask carrier worn on the individual and field level logistic support for additional filters**
- **For the DoD user, the advantage of the bayonet attachment on the JSGPM does not compromise the interoperability consideration for emergency responders outside of the DoD**
- **The DoD request to include another mechanical connector design to allow for NIOSH certification of the JSGPM meets the intent of DoD Instruction 6055.1**

# *DoD Request For Alternative Connector Design*

## **NIOSH/NPPTL is seeking input from stakeholders to determine the following:**

- Opinions on the current design requirement for the single 40-mm thread canister mechanical connector
- Rationale and data to maintain the current design requirement
- Rationale and data to support adding an alternate connector design for DoD applications
- Identification of alternative approaches to implement the alternative design concept for the canister mechanical connector
- Other comments on the subject



