

October 6, 2006

**Concept for Open Circuit CBRN SCBA in combination with  
Non-Powered CBRN Air-Purifying Tight-Fitting respirators  
and/or  
Powered Air-Purifying Tight-Fitting respirators**

**I. General Requirements**

- A. 42 CFR 84 requirements
  - 1. Subpart A: General Provisions
  - 2. Subpart B: Application for Approval
  - 3. Subpart D: Approval and Disapproval
  - 4. Subpart E: Quality Control
  - 5. Subpart F: Classification of Approved Respirators
  - 6. Subpart G: General Construction and Performance
- B. No type of disconnection or reconnection shall be permitted which could in anyway open the breathing circuit to ambient air when switching modes of operation
- C. Breathing circuits must be designed such that no backflow can occur from one mode to the other, including during switching operations
- D. Powered air purifying combination units must function and meet all of the requirements for non-powered units in the event of blower failure

**II. Combination Unit Specific Requirements:**

- A. Indicator of Operation Mode: Each respirator has an indicator which identifies to the user the mode of operation (air purifying or air supplied).
- B. The indicator must be distinguished and be readily apparent to the user without manipulation of the respirator by the user.
- C. Entire combination unit, when operated in any mode, must properly and acceptably function when subjected to most stringent tests/conditioning applicable to either combination

**III. Breathing Resistance, Canister:**

- A. Breathing Resistance will use criteria established in the CBRN APR standard

**IV. Field of View:**

- A. Visual Field Score (VFS) will be established in accordance with the existing CBRN APR method

**V. Lens Material Haze, Luminous Transmittance and Abrasion Resistance:**

- A. The Material Haze, Luminous Transmittance and Abrasion Resistance will be established in accordance with the existing CBRN APR method

**VI. Carbon Dioxide:**

- A. maximum allowable average inhaled carbon dioxide concentration less than or equal to 1% operated in any mode including PAPR blower off as tested in accordance with existing NIOSH STPs

**VII. Hydration (if so equipped):**

- A. Hydration systems will be tested using existing CBRN APR requirements

**VIII. Canister Test Challenge and Test Breakthrough Concentrations:**

- A. Only canisters permitted.
- B. Gas/vapor test challenges and breakthrough concentrations will be established using the CBRN APR standard criteria

**IX. Canister Capacity:**

- A. In accordance with CBRN APR or CBRN PAPR standard requirements.

**X. Particulate/Aerosol Canister:**

- A. In accordance with CBRN APR or CBRN PAPR standard requirements.

**XI. Service Life Testing, High Flow:**

- A. Each canister of non-powered systems to provide minimum service life time of 5 minutes when tested at a flow rate of 100 liters per minute, 50+- 5 percent relative humidity and 25 +-5<sup>0</sup>C for each of the gases/vapors.

**XII. Low Temperature/Fogging:**

- A. The low temperature/fogging requirements will be established using the CBRN APR standard criteria.
- B. Respirator must perform properly in all operating modes.
- C. All indicators, alarms, etc. must function as intended, remain accurate, and clearly indicate desired information

**XIII. Communications:**

- A. Communication requirements will be established using the CBRN APR standard criteria

**XIV. Durability Conditioning ( environmental, transportation shock and survivability):**

- A. NIOSH STP CBRN-0311
- B. Applies to entire respirator (including SCBA portion) except drop test
- C. Containers: subjected to conditioning in manufacturer-specified minimum packaging configuration.
- D. Only canisters subjected to drop test in its designated minimum packaging configuration.
- E. User's instructions (UI) shall identify minimum packaging configuration
- F. Over cases may not be a substitute for the minimum packaging configuration and will not be used in durability conditioning of the application

**XV Gasket, Mechanical Connector:**

- A. Applies to non-powered only
- B. Rubber Gasket Physical and Chemical Properties meet requirements as identified in CBRN APR standard

**XVI. Canister Dimensions and Weight**

- A. Applies to APR for face mask mounted canisters only for compliance with APR Interoperability.
- B. Meets requirements identified in the CBRN APR standard

**XVII. Tolerance Analysis:**

- A. Criteria will be established using the CBRN APR standard criteria.
- B. Combination SCBA/APR/PAPR will require interoperability.

**XVIII. Practical Performance: Modified Laboratory Protection Level (LRPL) Test:**

- A. For all- Tested in the heaviest and fully accessorized configuration
- B. For non-powered LRPL  $\geq 2000$  for requested configuration
- C. For non-powered for compliance with APR Interoperability: Modified LRPL performed using additional respirators fitted with a canister weighted to 500 grams and sized to the maximum (8 additional tests same as APR) LRPL  $\geq 2000$
- D. For powered: LRPL  $\geq 10,000$  in heaviest and fully accessorized configuration

**XIX. Chemical Agent Permeation and Penetration Resistance Against Distilled Mustard (HD) and Sarin (GB) Agent Test Requirement**

- A. Requirements will be established using the CBRN SCBA standard criteria

**XX. Other areas.**

- A. Additional requirements may be added.
- B. Requirements above may be modified.