National Personal Protective Technology Laboratory

Industrial PAPR Concept
Pittsburgh, PA

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Information Docket
Industrial PAPR

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Industrial PAPR Implementation

- Much of the Technical Work developed in the CBRN PAPR project can be applied to the Industrial Standard
- Will use Concept Paper format up to the initiation of Rulemaking – revised concept in 45 to 60 days
- Additional public meeting November 2005
- Formal Rulemaking Process –
  - Follow administrative procedures and staffing requirements
  - Target date for formal notice January 2006
  - 18 to 21 months to implementation (Fall 2007)
Overview

• Place all PAPR requirements in one subpart of 42 CFR
  – Keep existing general categories (Subparts A-G)
  – Supersede Subpart KK
  – Clarify/update/consolidate requirements
  – Incorporate requirements for breath response and constant flow units
  – Provide provisions for positive pressure units
Major Areas Under Consideration

- Indicators for flow/pressure & battery
- Low/moderate/high flow rating
- Two filter types (PAPR 95/PAPR 100)
- Single level canister/cartridge testing
- Conditioning/rough handling requirement
- General use (visual, human factors)
- Rated duration of battery in 1-hour increments
Specific Design Consideration Areas

- Accessible switches
- Flexible breathing tubes
- Harness design (unit and head)
- Marked containers
- Lens impact resistance
- Low pressure- real time indicator
- Low flow- real time indicator
- Battery charge indicator
- Noise
Specific Performance Consideration Areas

- **Flow- Positive pressure**
  - Low $\geq 14.5$ res./min @ 10.5 lpm
  - Moderate $\geq 24$ res./min @ 40 lpm
  - High $\geq 30$ res./min @ 86 lpm
    - + 30 res/min @ 103 lpm for 10 min

- **Flow- Continuous flow**
  - Low $\geq 85$ lpm tight, 115 lpm loose
  - Moderate $\geq 115$ lpm tight, 170 lpm loose
  - High $\geq 261$ lpm tight, 350 lpm loose- last 10 min
Specific Performance Consideration
Filter

- PAPR 95- 95% initial filter efficiency when tested against DOP

- PAPR 100- 99.97% efficiency when loaded with DOP as the test challenge

- Test at highest flow rate of system divided by number
Specific Performance Consideration
Gas/Vapor

- All tested in same manner
- Flow divided by number of units
- Concentrations similar to CBRN
Specific Performance Consideration – Inlet Covering

- CO2 machine test
  - 14.5 res/min 10.5 lpm, 5% CO2 ex., <=0.5% in.
- Breathing gas human subject test
  - Stand then walk at 3.5 mph
  - O2 >= 19.5%
  - CO2 <= 2%
- LRPL
  - PF >= 10,000 for >=95% of trials
Specific Performance Consideration - Other

- Eyepiece
  - Impact res. or state otherwise
  - Low temp fog resistant
- ESLI
  - Per existing criteria
- FMEA (failure mode effects analysis)
- Hydration device option
- Intrinsic Safety per recognized lab
New considerations

• All PAPRs tested and evaluated as positive pressure

• Evaluation criteria for silent mode operation
  – Test requirements with blower off
  – Could serve as FMEA

• Add field of view requirement