ISRP 2002 abstract

Presenter/author	Title	Abstract
Boord, Leslie **Dower**, John M. *National Personal Protective Technology Laboratory, NIOSH, Pittsburgh, Philadelphia, USA*	**NIOSH CBRN respiratory Protection Standards Update**	Emergency response forces in the United States are required under federal regulations to provide NIOSH-approved respirators appropriate for the expected hazards. NIOSH efforts to develop the appropriate respiratory protection standards began with a domestic assessment of potential chemical, biological, radiological, and nuclear (CBRN) terrorism agents. A review of national and international military and industrial respiratory protection standards for protection against terrorism agents was conducted. Based upon findings from the threat assessment and standards review, NIOSH developed a three year schedule for NIOSH CBRN respirator standards to address all classes of respiratory protection. In December 2001, NIOSH announced the first set of CBRN respirator standards to address open-circuit self-contained breathing apparatus (SCBA). Fire fighters and hazardous material incident (HAZMAT) responders expressed a primary concern that their open-circuit SCBA would survive a CBRN exposure. The NIOSH CBRN SCBA standard combines a three tier approval structure: NIOSH industrial SCBA approval; National Fire Protection Association fire service certification; and three special performance tests against chemical warfare agents and facepiece protection levels. Current CBRN respirator standards efforts are directed at standards for full facepiece air-purifying respirators. Standards concepts and future standards schedules will be discussed.

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Respirator Certification

US(54), Australia(1), Canada(1), Chile(2), China(2), Denmark(1), England(6), Germany(3), Italy(1), Japan(2), Korea(1), Mexico(1), New Zealand(1), Taiwan(4), Thailand(2), Sweden(2)

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CBRN Standards Development

- Workshops/Committee Meetings
  - NIOSH-DOD-OSHA Chemical-Biological Respiratory Workshop & Report
  - Interagency Board Standards & PPE Committees
- MOU's and Agreements
  - Memoranda of Understanding with NIOSH, NFPA, NIST, and OSHA
  - NIST-NIOSH and NIST-SBCCOM Interagency Agreements
  - Interagency Agreement – DOE
- Agency Support
  - CDC and NIST Program Support
- Stakeholders
  - User Groups and Manufacturing Organizations: IAFF, IAFC, NFPA, IAB and ISEA

CBRN Standards Development

- Why Not Military Respirators?
- Inherent Differences Between NIOSH & Military Standards
  - Purpose
  - Target User Groups
  - Hazards
  - Operation
  - Protection

CBRN Standards Development

	NIOSH
Purpose	Product Certification Minimum design, performance, quality
User Group	General worker population – wide fitness levels & age
Hazard	Toxic industrial chemicals, O_2 Deficiency; Fire
Operation	Hazard characterized w/engineering & admin. controls
Protection	40 hrs/wk, 30 yr. With no adverse health effects

CBRN Standards Development

	NIOSH	Military
Purpose	Product Certification Minimum design, performance, quality	Product Procurement Performance specs/ operational requirement
User Group	General worker population – wide fitness levels & age	Physically conditioned military personnel – younger age group
Hazard	Toxic industrial chemicals, O_2 Deficiency; Fire	Chemical warfare agents under battlefield scenarios
Operation	Hazard characterized w/engineering & admin. controls	Hazard characterized, escape paths, dissipate w/time & weathering
Protection	40 hrs/week, 30 yr. with no adverse health effects	Limited missions Limited casualties & incapacitations

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CBRN Standards Development

	NIOSH	Military	Terrorism
Purpose	Product Certification Minimum design, performance, quality	Product Procurement Performance specs/ operational requirement	Product Certification Enhanced design, performance, quality
User Group	General worker population – wide fitness levels & age	Physically conditioned military personnel – younger age group	Wide age emergency Responders – better physical fitness
Hazard	Toxic industrial chemicals, O_2 Deficiency; Fire	Chemical warfare agents under battlefield scenarios	Bio, chemical, rad & warfare agents in extreme conditions
Operation	Hazard characterized w/engineering & admin. controls	Hazard characterized, escape paths, dissipate w/time & weathering	Hazards unknown uncharacterized uncontrolled
Protection	40 hrs/week, 30 yr. with no adverse health effects	Limited missions Limited casualties & incapacitations	Multiple limited term engagement w/mild non-persistent effects

CBRN Standards Development

- CBRN Standards Development Process
  - Hazard Analysis
  - Protection
  - Human Factors/Environmental Factors
  - Concept Definition
  - Test Requirements
  - Testing/Validation
  - Quality Assurance Provisions
  - Peer Reviews (Public Process)

CBRN Standards Development

CBRN SCBA

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CBRN Standards Development

- CBRN SCBA Standard
  - Hazard Analysis
    - Credible Event Modeling
    - Sarin, GB: 2000 mg/m^3
    - Mustard, HD: 300 mg/m^3 & 0.86 ml
  - Protection
    - Penetration/Permeation by CW Agents
    - Breakthrough
    - GB: 0.087 mg/m^3 peak & 2.1 mg-min/m^3 C_t
    - HD: 0.6 mg/m^3 peak & 6.0 mg-min/m^3 C_t

CBRN Standards Development

- CBRN SCBA Standard
  - Human / Environmental Factors
    - Particulate:
      - Silica Flour, 1 hr., 40 lpm
    - Vibration:
      - 250 rpm, 3 hours
    - Corrosion Resistance:
      - Salt Spray, 48 hrs, 50% RH, 48 hrs.

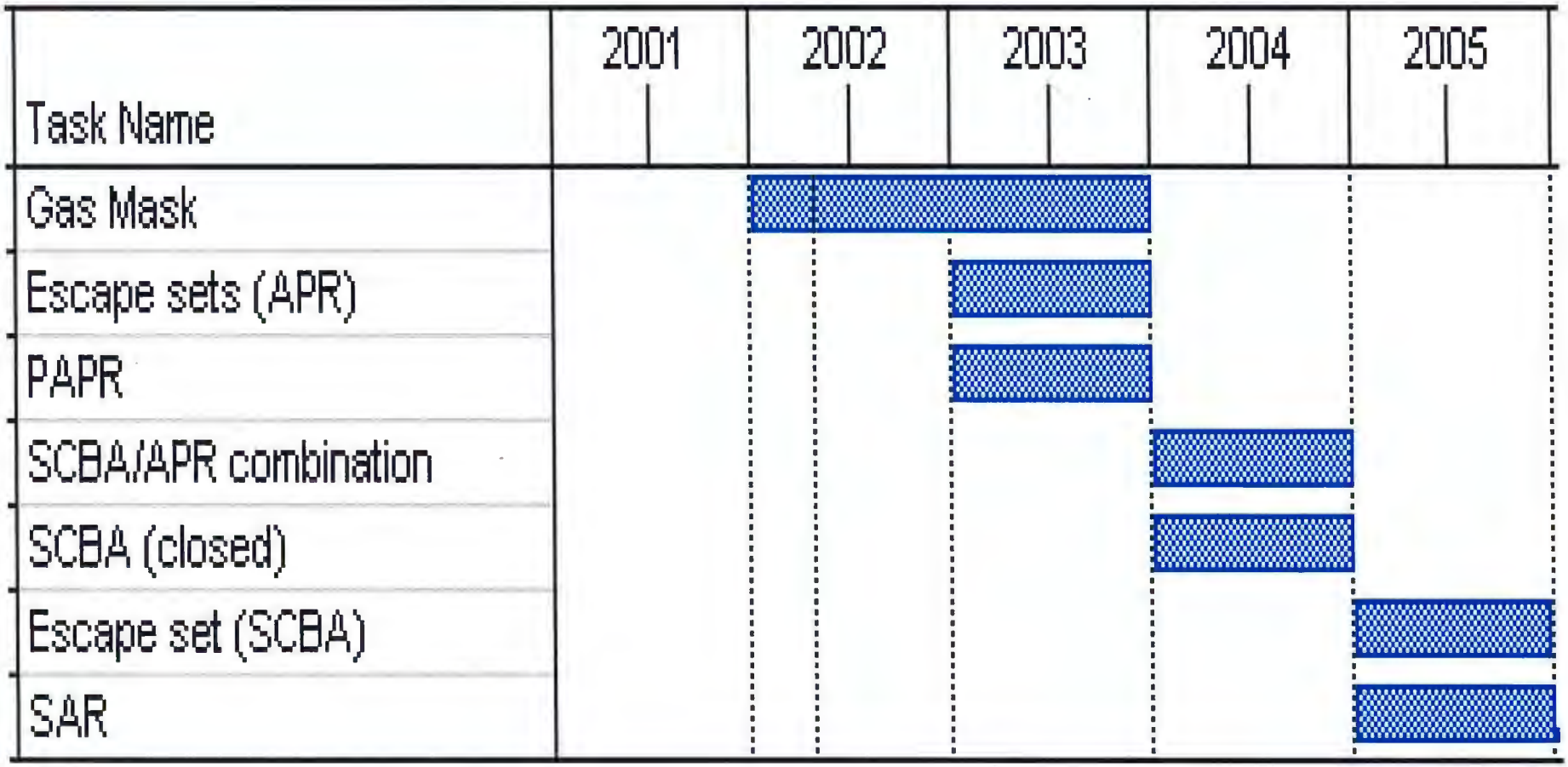
CBRN Standards Development

- CBRN SCBA Standard
  - Human / Environmental Factors
    - High Flow:
      - 300 lpm peak, 103 lpm ventilation
    - Speech Intelligibility:
      - 70 dba Background
    - Hot / Cold Exposure:
      - 71^{0}C & -32^{0}C, 12 hrs
    - Heat & Flame:
      - 95^{0}C, 40 lpm, 15 minutes
      - 950^{0}C, 103 lpm, 10 seconds
      - Drop 150 mm (6in.)

CBRN Standards Development

- CBRN-SCBA – 3 Tier Standard
  - 42 CFR, Part 84 (NIOSH)
  - NFPA 1981, Current Edition
  - Special Tests
    - CW Agents (GB & HD)
    - Respirator Fit
- CBRN-SCBA Standard Implemented January 22, 2002
- Certification Testing in Process
  - First Approval Issued May, 2002

Schedule



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CBRN Standards Development

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