CBRN WORKSHOP

Respiratory Protection Program (RPP) Discussions in Emergency Response

Terrence K. Cloonan, Physical Scientist, NIOSH/NPPTL with special guest instruction from Bob Anthony, Scott Hurley, Marty Nevil, Bob Edmiston, Phil Smith, Alexis Alicea, and Tom Cloonan

Hyatt Regency Hotel and FAA Regional ARFF Facility Pittsburgh International Airport, Pittsburgh, PA
March 21, 2012, 0800 – 1300hrs
Participating Emergency Responders

- Chicago Fire
- San Francisco Police
- PA-TF1 US&R
- Fort Indiantown Gap Fire
- FBI, Pittsburgh Division
- 3rd Civil Support Team (WMD) DOD CBRNE
- Allegheny County Airport Authority Fire
- Mt Lebanon Fire
Themed Approach

- Responder success stories
- **Theme 1:** RPP relevancy
- **Theme 2:** Recognition: How do you know the respirator is NIOSH-approved CBRN?
- Presentations & demos
- **Session 1:** Fundamentals
- **Session 2:** RPP practical
- Sign-in rosters, butcher paper notes, local shuttles & training certificates
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Why have a Written Program?

- Quality control of deployed configurations and lot numbers
- Field inspections before use in training & live opns
- Donning and “in-use life”
- Multiple types & brands in use
- Various protection options
CBRN RPP Fundamentals

• Respiratory threats: What are the “all-hazards”?
  • Terrorism: CBRN/CBRNE-CWA, BWA, RDD, fallout
  • TIC/TIM: CL/NH3 tankers & bulk pesticide releases
  • Industrial Facility: known or proprietary hazards
  • Residential: fire, smoke, meth, hoarding, unknown
  • Confined Spaces: displaced oxygen, high H2S/CO
  • Chemical suicides: cars, buses, rooms, attics
  • Energy: Marcellus Shale oil & gas HAZWOPER
  • Coordinated Complex Attack: Mumbai style flames
  • Active Shooter: CS, CN, smoke, & “flash-bangs”
Federal Regulations & Guides

- OSHA 29 CFR 1910.120 - HAZWOPER
- OSHA 29 CFR 1910.146 - Confined Space
- OSHA 29 CFR 1910.156 - Industrial Fire Bde
- EPA 40 CFR 311 - Worker Protection
- OSHA pub 3352-02, 2009 - APF for RP Std
- OSHA pub 3384-09, 2011 – Small Entity Guide
- OSHA Interpretation Letter: Dec 27, 2011, CBRN
- DHHS (NIOSH) pub # 2004-101, Oct 2003, RP √ list
- DHHS (NIOSH) pub # 2009-132, April 2009: BWA
- DHHS (NIOSH) pub # 2011-183: CBRN SCBA
OSHA 1910.134(c) and OSHA 3384-09 pg. 13

NIOSH: “A respiratory protection program is a written program required by the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard (29 CFR 1910.134). The program includes procedures specific to your worksite intended to prevent you from inhaling harmful contaminants in your workplace. OSHA requires that each employer must provide respirators to protect workers from workplace hazards during work to prevent inhalation of hazardous materials that cannot be controlled by other measures (i.e. engineering or administrative controls). The employer must establish and maintain a respiratory protection program, which is compliant with the OSHA respiratory protection standard and provides respirators suitable for their intended purpose.”

States: Cal/OSHA: Title 8, subchapter 7, group 16, article 107. § 5144, Respiratory Protection, (c). http://www.dir.ca.gov/Title8/5144.html

DOD PA ARNG: RPP SOP dated July 1, 2010
National US&R Response System: PATF-1 RPP, 1/31/12
NIOSH-approval required. But how is it recognized?
Draft Model CBRN RPP Outline

- 29 CFR 1910.134 - Respiratory protection standard with assigned protection factor 2009 revision is the foundation
- Model CBRN RPP Outline, Draft (Note: NIOSH does not certify/approve RPPs)
  - Permissible practice: Hierarchy of control measures interpreted and applied by assigned industrial hygienists
  - Definitions: OSHA 1910.134 (b)- 35 definitions - Tailored to responder needs by mission industrial hygiene working groups
  - Respiratory protection program scope and risk assessment mission logic developed from lead working group addresses:
    - EVALUATIONS - of hazards, initial training, selection, assigned protection factors use, IDLH values (APF) x PEL = MUC (maximum use concentration), oxygen deficient atmospheres, change-out schedules, cylinder service life, cylinder warranty life, cylinder neck valve assemblies, hydro-test
    - MEDICAL - evaluation, questionnaire, clearance, periodicity, disqualifiers, and claims of users
    - FIT TESTING – QNFT, QLFT, facial hair, and evaluation of tight fitting respirator methods
    - ESTABLISHMENT - worksite control procedures for proper use by workers, visitors, & contractors
    - MAINTENANCE – cleaning, sanitization, and care of respirators: user and technician
    - BREATHING AIR - quality, certificates, use in SCBA and SAR, manifolds, and SCBA for “escape”
    - FILTRATION – cascades, ID of filters/colors/cartridges/canisters & capacity ratings w/mobile apps
    - USE - training on mandatory/voluntary use, evaluation of use, mayday, & where to use/not required
    - ARCHIVE OF RECORDS - record keeper and record keeping & activation and termination of RPP
    - AUDITS - systematic program evaluation of users, suppliers, and administrators
    - APPENDICIES A, B-1, B-2, C, & D – first four are mandatory. D is voluntary use
    - DATE/SIGN: Publication & Effective date w/Signature – author and administrator
  ➤ Model Outline: 12 mission logic areas, 64 model topics, w/specific user task matrix
Recognizing CBRN Respirators

CBRN Agent Approved

See Instructions for Required Component Part Numbers, Accessories, and Additional Cautions and Limitations of Use
Recognizing a CBRN SCBA

- Knowledge of technology & terms
- Consensus standards, DOT & NIOSH
- NIOSH certified equipment list (CEL)
- User instructions & NIOSH labels
- NIOSH “CBRN Agent Approved” decal

Common sub-assemblies:
- Tight fitting facepiece with a nose cup
- Detachable mask mounted regulators (MMR) vs. facepieces that have integrated non-detachable regulators. Integrated PASS devices or stand-alone PASS devices. Heads-up-display (HUD), high/low pressure air lines, movement alarms, & stealth features
- Portable air cylinder with neck valve assembly on a back frame
Required Decals on CBRN SCBA

**CBRN Agent Approved**
See Instructions for Required Component Part Numbers, Accessories, and Additional Cautions and Limitations of Use

**CBRN Agent Approved (Retrofit)**
See Instructions for Required Component Part Numbers, Accessories, and Additional Cautions and Limitations of Use
42 CFR 84.63(c): Special Tests for CBRN
Benchmark testing of non-CBRN hardened SCBA against chemical warfare agents demonstrated that agents could cause catastrophic failures within minutes of exposure.


GB: Mannequin zones were penetrated in 5.5, to 6, to 7-12, to 25-39 minutes per benchmarked open circuit SCBA.

HD: Catastrophic effects in 45 to 90 to 105 to 110 minutes.
NIOSH Caution and Limitation Statements are the Key
Tests Results Translated to Guidance
2011 NIOSH Fact Sheets


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Fire Service Summary

- Large departments: high quantity of front line SCBA and high % of use (45/1650/4700/10050)
- Manage all types of air sources, detectors, and thermal imagers
- Sustain fit testing instruments & air cylinder fill station air quality certs
- CBRN SCBA = six hour LAT results
- RPP updates: 5,500 psig cylinders
Law Enforcement Summary

- Large departments: high quantity of APR and low to medium % of actual use
- Mix of NIOSH-approved industrial and NIOSH CBRN
- NIJ CBRN PPE standard = new LE CBRN respirator standard?
- Bomb suit respirator needs
- RPP development: need a CIH
- APR in use, OC & CC-SCBA in reserve. CBRN APR Cap 1 canister lot numbers expiring
- Vehicles w/on-board air supply
Urban Search & Rescue (US&R) Summary

- State and Federal activations, therefore, RPP must be defined
- Deployable logistics are dynamic and respirator inventory is diverse
- Dedicated HAZMAT Annex (CBRN)
- Mix of NIOSH-approved industrial and NIOSH CBRN respirators
- APR canister change-out schedule work. SAR on 600ft
- Do US&R teams have the same type & brand of respirators across the nation or is each team outfitted w/different types/brands?
National Guard Fire Service Summary

- One dedicated fire department per military installation
- Large areas of terrain and life saving responsibilities
- Pure “All-Hazards” focus with/without ARFF mission
- 24 hour/day maximum capability with a minimum of a 16 hour/day capability per department/installation budget
- Commonwealth Department of Military and Veterans Affairs, Army National Guard, State Safety and Occupational Health Office: RPP SOP, dated July 1, 2010 Fire service respirator requirements pending update.
- GS military technicians trained to the Hazmat Opns level
- CBRN attack PPE is turnout gear and CBRN SCBA
- NIOSH-approved CBRN SCBA on-hand: How do you know?
Dynamic success stories

Written respiratory protection programs focus resources, worker experience, technology evolution, and safety science together ........ in one user oriented policy document.

NIOSH-approved respirators are the nucleus of worker PPE and user safety:

- Breathing zone protection
- Ocular area protection
- Facial dermal zone protection
FAA Regional ARFF Training Facility

FAA Regional ARFF Training Facility
Pittsburgh International Airport

No Trespassing
Property of Allegheny County Airport Authority
## Live Exercises

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FBI WMD Coordination & Hazmat

• Lead federal law agency for WMD
• WMD and HAZMAT are unique
  – WMD is CBRN or CBRNE
  – HAZMAT is TIC and TIM
• Default to HRT mission focus
• Basic tenets of combat practiced
• Tactical nature is priority over PPE
• PPE stealth/ease of use is stressed
• APR & PAPR only: Change-out rules
• No SCBA = restricted to < IDLH hazard
DOD CST (WMD) Summary

- Pure military mission to support civil authorities
- OP-tempo is to train daily & maintain specific levels of readiness and certification
- Use of mil-spec, NIOSH-approved industrial, and NIOSH-approved CBRN respirators is prevalent
- CBRN SCBA recognition needs
- “Rapid adapter” use of C2A1 on CBRN SCBA facepiece
- FR M40 in use with FR-C2A1
ARFF Facility Burn and Tour

- FAA regional aircraft rescue fire fighting (ARFF) training facility, 135 ft
- Operated by the Allegheny County Airport Authority (ACAA) on the Pittsburgh International Airport
- Gated access facility with live fire pit and tower with classroom. Full PPE required beyond the pit circular area.
- ACAA demonstrated three sample fuel burn fires: pit, engine, and wheel
- CBRN decon corridor capacity exists
- NIOSH-approved SCBA in use. CBRN SCBA recognition training invitation
Mt Lebanon Fire Department

- CFAI accredited effective 3/7/2012
- Aerial ladder truck operated by four FF
- Extended for demonstration purposes
- On board turn-out gear and SCBA PPE
- NIOSH-approved SCBA
- How do you know the SCBA are NIOSH CBRN approved?
- Are NIOSH-approved CBRN APR on-hand?
- Department supports gross decon tasks
- How is the municipality respiratory protection program managed?
Translating CDP Training to Best Practices

- NIOSH employee embedded with 32nd Chemical CO (Heavy Decon) at the FEMA CDP, Anniston, Alabama, July 2011
- Mil-spec PPE used: M40A1, C2A1, butyl gloves, LANX suit
- Fit testing is an odor sense test, then QNFT, & then QLFT+
- Service gallery work: size-up, SKED use, medical scissors
- Bending over: M40 seal break, cool air rush, resealed itself
- Gallery decon: CL rinse & eye check. Buddy glove rip
- Bay 5 entry- GB: M8 paper, M256A1, ICAM, gloved hand use
- Second hasty decon of gloves & flashlight eye check
- Bay 3 entry- VX: Modified M256A1, M8 paper, TIC detector
- M40 mask: indicators of seal break = fogging of eye lens
Workshop Debrief

• Session 1:
  • Fundamental information disseminated
  • Success stories and experience shared
  • Attendees gained first-hand insight from responders
  • Responders gained input from NIOSH and stakeholders

• Session 2:
  • Live exercise showed the theory in practice
  • Remote site ideal for future demonstrations
  • Training input needs went from stakeholders to NIOSH
  • Recognition of NIOSH-approved vs NIOSH-approved CBRN
Thank you!!!

Disclaimer: The findings and conclusions in this presentation have not been formally disseminated by the National Institute for Occupational Safety and Health (NIOSH) and should not be construed to represent any agency determination or policy.

“Preparing The Nation’s First Responders” NPPTL 2004 CBRN slogan

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