

CBRN Respiratory Protection Program Designs

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OBJECTIVES

- Provide technical insight to authorities interested in improving written respiratory protection programs (RPP) based on OSHA 29 CFR Part 1910.134 and the integration of NIOSH-approved chemical, biological, radiological, and nuclear (CBRN) respirators. Compare the real-time respiratory protection programs to 1910.134, NFPA 1404, and best practices.
- Design respiratory protection program templates per 1910.134, NIOSH CBRN statements, and stakeholder feedback.

EXTERNAL STAKEHOLDERS

- U.S. Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), Center for Domestic Preparedness (CDP), Anniston, Alabama
- Los Angeles Police Department (LAPD) SWAT, HAZMAT, Bomb Squad, & Counter Terrorism Unit, CA
- San Francisco Police Department (SFPD) patrol, Tactical Unit, and Bomb Squad, CA
- San Francisco Fire Department (SFFD), San Francisco, CA (Proposed as of 26April2011.)
- Pennsylvania Task Force 1, Urban Search and Rescue (PATF1), Harrisburg, PA
- Pennsylvania South Central Task Force (SCTF), Harrisburg, PA
- Safety Manager, City of Mobile, Alabama; Fire and Rescue Department and Auto Body Repair Shop

STAKEHOLDER RESEARCH to PRACTICE (r2p) PARTNERS

- NIOSH Education & Research Center, Deep South Center for Occupational Health and Safety, University of Alabama at Birmingham and Auburn University, Alabama



Figures 1a, 1b, and 1c:
Fire service responder
conducting a donning and
going "on-air" drill using a
NIOSH-approved CBRN
SCBA and NFPA
compliant turn-out jacket.



Figures 3a, 3b, & 3c: "CS House" user confidence, respirator fit, and user seal check exercises for SCBA/APR.

United States Respiratory Protection Program Discussions

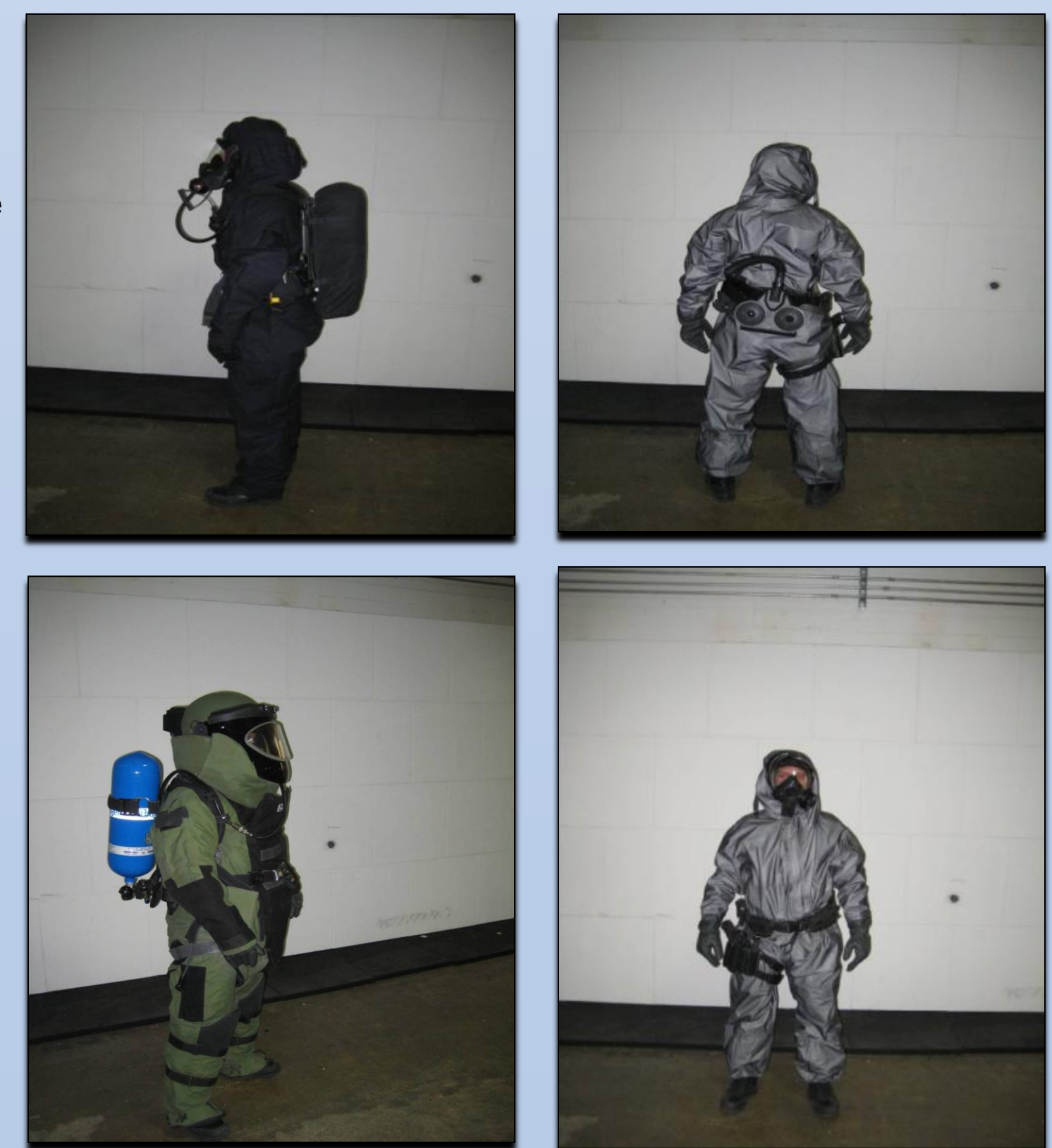
- **Fire Service:** As of March 14, 2011, U.S. Air Force, Army, Navy, and DHS FEMA Urban Search and Rescue teams deployed to Japan have active respiratory protection programs for government civilians.
 - US Tier I fire service continues to use variations of written/non-written respiratory protection programs.
 - US Tier II and III cities rely on "partial RPP" through the use of policy letters, SOP, and SOG.
 - The use of written RPP is not pervasive in non-OSHA states. Fire academies set the tone for PPE use.
 - The use of unapproved replacement parts is still viewed as advantageous economically.
 - Individual SCBA facepieces are being issued to the lowest level, but not always in correct sizes.
 - Individual SCBA second stage regulators are not issued to individual personnel for individual use.
 - NIOSH-approved meaning is misunderstood to incorrectly equal NIOSH-approved CBRN protection.
 - Field SCBA upgraded to *CBRN Agent Approved (Retrofit)* require quality assurance inspections.
- **Law Enforcement:** Written RPP are in development. FBI HMRU continues to set the readiness standard. Tear gas/CS/OC is a less-lethal chemical agent used in riot control & respirator training per figures 3a-3c.
 - City police departments require respiratory protection from the effects of clandestine laboratory hazards, riot control agent devices, hydrogen sulfide suicide incidents, and biological powder incidents.
 - Disabling of SCBA PASS and signaling devices are conducted by not inserting power source batteries.
 - Repeated exposures to flash-bang and smoke munitions is ongoing. SCBA & APR are the predominate technologies in use but not always in NIOSH-approved configurations. New respirators require law enforcement use standards. Industrial hygiene personnel are needed at police department levels.

Research Completed

- **Literature Search:** As of March 8, 2011, 155 working respiratory protection programs have been collated by NIOSH-NPPTL: 8 business examples, 18 federal agencies, 42 fire service, 4 healthcare, 15 law enforcement, 2 plastics industry, 42 plans from 14 states, 22 university programs, and 2 FEMA urban search and rescue team documents.
 - **Research to Practice:** Agencies have submitted respiratory protection programs or consulted with NIOSH for informal review of new, existing or draft written and partial respiratory protection plans:
 - Cities/Boroughs of the South Central Pennsylvania Task Force (SCTF), Harrisburg, PA
 - Pennsylvania Urban Search & Rescue (US&R) Task Force 1 (PATF1), Harrisburg, PA
 - City and County of San Francisco Police and Fire Departments, San Francisco, California
 - City of Los Angeles Police Department, Los Angeles, California
 - Boston Fire Department HAZMAT Team, Boston, Massachusetts
 - City of Mobile, Mayor's Office, Safety Manager, Alabama
 - **US&R Design:** Urban search & rescue RPP template submitted to the NFPA 472/473 committee.
 - **SWAT Design:** SWAT RPP template submitted to the National Tactical Officers Association (NTOA).
- NOTE: NIOSH is providing technical insight specific to the limitations of NIOSH-approved CBRN respirators. NIOSH does not certify written respiratory protection programs or respirator use policies.

Interim Conclusions

- **LER:** The NIJ standard-0116.00 requires NIOSH-certified CBRN respirators for use in incremental protective ensemble postures known as law enforcement response levels 1 – 4 (LERL) shown in the top right angle three images. Four photos to the right & top three are courtesy of Officer Scott Hurley, SFPD.
 - **Fire:** The NFPA 472 committee is evaluating the integration of a draft RPP template outline in the next generation NFPA 472-XX HAZMAT Competencies standard.
 - **Hazardous Device Technicians:** Bomb squad personnel, as shown to the right, require less burden on the user and maximum protection afforded by PPE. Technicians typically rely on one brand of SCBA for chem-bio visor compatibility.
 - **Conclusion:** The need for joint OSHA-NIOSH CBRN respiratory protection program assistance visits are warranted.
- Disclaimer:** The findings and conclusions in this poster have not been formally disseminated by NIOSH and should not be construed to represent any agency determination or policy. April 20, 2011.



PPE and Respiratory Program Regulations, Guidance, & Standards

- OSHA 29 CFR Part 1910.134 requires an employer to develop and implement a written RPP with procedures.
- OSHA 29 CFR Part 1910.132 requires workplace hazard assessment and PPE selection and training.
- OSHA 29 CFR Part 1910.120 and NIOSH publication No. 2008-132 require/cite a written PPE program.
- NIOSH and DOL MSHA 42 CFR Part 84 addresses certification requirements for respirators.
- OSHA 3352-02 2009, *Assigned Protection Factors for the Revised Respiratory Protection Standard* specifies that the employer should have a program if it is likely there is a need to establish & implement a RPP.
- OSHA 3370-11 2009, *Best Practices for Protecting EMS Responders during Treatment and Transport of Victims of Hazardous Substance Releases:* Guides employer to develop a RPP per 29 CFR Part 1910.134.
- OSHA 3079 2002 (revised) *Respiratory Protection:* Information booklet of frequently asked questions.
- OSHA Safety and Health Topics RPP link: <http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- OSHA/NIOSH Interim Guidance CBRN PPE Selection Matrix recommends use of NIOSH CBRN respirators
- NIOSH/OSHA/USCG/EPA publication No 85-115 states a written PPE program should be established.
- **State/County/Local Governments:** OSH Act of 1970 exempts public sector employees from coverage unless specified in an OSHA-approved state plan. Therefore, public safety RPP development is at the local government level.
- **NIOSH CBRN Respirator Statement of Standards:** CBRN SCBA, APR, APER, and PAPR tight and PAPR loose fitting
- **NFPA 1404 Standard, 2006 edition:** Cites section 7.3 of NFPA 1500 standard requiring an RPP and specifies that respirators used in training evolutions simulating exposure to weapons of mass destruction shall meet the appropriate sections of 42 CFR Part 84 and shall be marked with a CBRN rating.
- **ANSI Z88.2 Respiratory Protection:** Dated version cited by manufacturers. Consensus standard on science & use art.

Occupational Health and Public Safety Topics for Discussion



Figure 2: NIOSH-nonCBRN PAPR attached to ballistic vest.

- **Public Safety RPP:** NIOSH-approved CBRN respirators are in use by public safety employees but so are military specified, NFPA non-compliant, and NIOSH non-CBRN respirators, see figure 2. How do they complement each other? Medical evaluations and fit testing appear to be marginalized. How can they be required and shown relevant?
- **Post Fire and Flashover Simulator Environments:** Respirators are not being worn in post fire overhaul and flashover simulator clean-out operations. Supervisors should be empowered to make-on-the-spot corrections and enforce respirator use discipline. How can respirator use discipline be maintained?
- **RPP Content:** RPP should not be streamlined but should be concise and adapted to the workplace?
- **Relevancy:** 1970 OSH Act exempts the public sector from coverage. How is EPA 40 CFR 311 applied?