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To: NIOSH Docket Office (CDC)
Subject: 082-A - Chemical, Biological, Radiological and Nuclear (CBRN) Combination Respirator Unit (CRU)
Attachments: Spelce - CBRN Combo Respirator Docket 082-A 2Feb2011.doc

My comments on NIOSH Docket 082-A are in the attached file.

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COMMENTS ON
NIOSH Docket # 082-A
CBRN Combination Respirator Unit
2 February 2011
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Ref: (a) Concept of Discussion for the December 9th 2010 Public Meeting to Request For Information (RFI) for the Development of NIOSH Chemical, Biological, Radiological and Nuclear (CBRN) Combination Respirator Unit (CRU) Performance Standards of 5 Nov 2010
(b) NPPTL Statement of Standard for Full Facepiece Air Purifying Respirators of 7 Mar 2003, as revised through 30 Jan 2004
(c) NPPTL Statement of Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Powered Air-Purifying Respirators (PAPR) of 6 Oct 2006
(d) NPPTL Statement of Standard for Self Contained Breathing Apparatus (SCBA) with CBRN Protection To Protect Emergency Responders Against CBRN Agents in Terrorist Attacks of 28 Dec 2001
(e) Occupational Safety and Health Administration (OSHA): 29 CFR Parts 1910 and 1926 Respiratory Protection: Final Rule. Federal Register 63(5):1278–1279. Washington, D.C.: U.S. Government Printing Office, Office of the Federal Register, January 8, 1998, as amended through 12 Dec 2008
(f) National Institute for Occupational Safety and Health (NIOSH): Respirator Selection Logic. DHHS (NIOSH) Publication No. 2005-100. Cincinnati, OH: NIOSH, 2004.
(g) Draft Guide to the Technical Use of Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit, Pressure-Demand Self-Contained Breathing Apparatus (SCBA) Respirators Certified Under 42 CFR Part 84

In reference (a), the National Institute for Occupational Safety and Health (NIOSH) requested comments on developing certification standards for combination respirator units (CRUs) comprised of two or more respirator types to provide first responders with multifunctional respiratory protection against Chemical, Biological, Radiological, and Nuclear (CBRN) hazards resulting from acts of terrorism. The following recommendations are provided in response to specific questions listed below:

NIOSH Question: Is the current nomenclature used by NIOSH, CBRN "Combination Respirator Unit (CRU)" adequate or does it lead to confusion?

Recommend replacing the word "Unit" in CRU with the word "respirator." The word "Unit" is superfluous and this new and unneeded term will lead to confusion. The term unit is very un-descriptive and no other type of respirator is referred to as a unit. In contrast, the term "respirator" is very descriptive, even to individuals outside of the respirator community. Other types of combination respirators are named in the *NIOSH Certified Equipment List* as combination respirators without including an unnecessary and redundant term, such as "Unit" to their nomenclature.

Therefore, recommend deleting the word "Unit" in the term "CBRN Combination Respirator Unit" and renaming these respirators per NIOSH respirator nomenclature convention as NIOSH "CBRN Combination Respirators."

NIOSH Question: Section 84.63b of 42 CFR 84, a combination respirator will be classified by the type of respirator in the combination which provides the least protection to the user; therefore, in most cases, a combination respirator will be approved by NIOSH as an APR even though it can provide a higher level of protection when used in the supplied-air mode (SCBA).

Recommend that each component of CBRN Combination Respirators receive NIOSH CBRN approval for their respective mode of operation. In addition, recommend that the complete combination respirator assemblage receive approval under an overarching CBRN Combination Respirator certification. Under this approval classification, respirator wearers will be protected with the assigned protection factor (APF) for the mode of operation under which the CBRN Combination Respirator is being used.

More specifically, recommend requiring NIOSH CBRN Combination Respirators pass a tiered approval process, analogous to NIOSH CBRN SCBA certification. Recommend an overarching certification schedule for NIOSH CBRN Combination Respirators establishing requirements for safe transition between the different modes of operation, including the negative pressure air-purifying, powered air purifying, and atmosphere supplying respirator components while inside hazardous environments. Recommend this overarching certification schedule contain all the details for certifying the complete combination respirator assemblage and require NFPA 1981 compliance as a provision of NIOSH certification. It should also require that the combination respirator meet all CBRN certification requirements for each mode of operation. In other words, the CBRN air-purifying component must meet requirements of the reference (b), CBRN Statement of Standard for air-purifying respirators, the CBRN PAPR component must meet requirements of the reference (c), CBRN Statement of Standard for PAPRs, and the CBRN SCBA component must meet requirements of the reference (d), CBRN Statement of Standard for SCBAs.

When CBRN Combination Respirators receive NIOSH approval under the overarching CBRN combination certification schedule and also receive approval under the appropriate CBRN Statements of Standard for each mode of operation, then the respirators can be worn up to the APF designated for the mode of operation in which the combination respirators are used.

NIOSH Question: Is it necessary to change 42 CFR 84 Section 84.63b [combination respirator will be classified by the type of respirator in the combination which provides the least protection to the user] so a CRU can be worn in IDLH?

Recommend changing Section 84.63(b) of 42 CFR 84 to allow certifying combination respirator components under the certification schedule for each respective mode of operation. Under this proposed approval classification, the CBRN Combination Respirator will be certified for entry into IDLH atmospheres when worn in the SCBA mode of operation.

NIOSH Question: Will the requirements in the future CRU performance standard conflict with existing Federal Rules and Regulations, and Other Standards Developing Organization's standards in order meet the operational needs of the users in the First Responder/Receiver community.[?] What are the Federal Rules and Regulations that has the potential to conflict with the development of the CRU performance standards?

Yes, according to Section 84.63(b) of 42 CFR 84: *"...combination respirators, except as specified in Sec. 84.70(b)(2), will be classified by the type of respirator in the combination which provides the least protection to the user."* This conflicts with OSHA policy in paragraph (d)(3)(i)(A) of 29 CFR 1910.134, which states: *"When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used."*

To illustrate this conflict, under NIOSH policy quoted above the continuous flow supplied-air component of a combination supplied air/ air-purifying full face respirator is classified under the air-purifying mode of operation. Therefore, the supplied-air component has the same assigned protection factor as the air-purifying component of the combination respirator. In contrast, OSHA allows wearing the combination respirator in the full face supplied-air mode in atmospheres up to the APF of 1,000 - not the APF of 50 for the air-purifying mode of operation.

Having CBRN Combination Respirators receive NIOSH approval under an overarching certification schedule and also receive separate CBRN approvals for each operational component will align NIOSH policy with OSHA policy in paragraph (d)(3)(i)(A) of 29 CFR 1910.134. In other words, when the NIOSH CBRN Combination Respirator is worn as a SCBA then it can be worn into IDLH atmospheres; when worn as a PAPR then it can be worn in atmospheres requiring APFs up to 1,000; when worn in the full face CBRN air-purifying mode then it can be worn in atmospheres requiring APFs up to 50. Otherwise, this same CBRN Combination Respirator according to current NIOSH policy could only be worn in atmospheres up to an APF of 50. This current NIOSH policy will defeat the purpose of certifying two or more different types of respirators as a combination respirator because it will not meet the multifunctional requirements of CBRN first responders.

NIOSH Question: For a CRU to be classified as a SCBA/SAR by NIOSH for approved entry into an IDLH atmosphere, should it be required for a CRU to automatically switch from an air-purifying mode to a supplied-air mode based on the hazard level of the atmosphere. Is there the sophisticated level of sensor/detection technology available that can be integrated into the CRU that is reliable to adequately switch the CRU back and forth between an air-supplied mode and an air-purifying mode based on an IDLH or non-IDLH condition, respectively? Is there new or emerging sensor/detection technology that can specifically identify a chemical respiratory hazard, concentration, and percent oxygen level in an atmosphere which can be integrated into a CRU to switch between air-supplied and air-purifying modes?

I encourage NIOSH to develop respirator certification standards for approving next generation CBRN Combination Respirators that allow users to safely manually convert between SCBA/PAPR/APR modes of operation based on heads-up-display ambient air readings and end-of-service-life indicators. However, I do not believe that there is current sensor/detection

technology sophisticated enough to rely upon automatically switching between air-supplied and air-purifying modes of operation. Even if sensor technology could accurately detect contaminant concentration and oxygen levels, automatic switching between modes of operation should not be solely based on detecting oxygen and contaminant concentrations. Respirator selection is not as simple as for example, state-of-the-art welding helmet visor technology that automatically darkens the lens in response to striking a welding arc. As described in reference (f), the process of respirator selection is based on considering many different variables and involves adhering to logic derived from following many steps in the selection process.

NIOSH Question: If manually switching is permitted, what standards be it operational or equipment, need to be developed so a wearer can manually switch from a supplied-air mode to air-purifying mode based on the hazard level of the atmosphere?

As discussed in the previous comment, respirator selection is a complex process and must be performed by knowledgeable and experienced individuals. CBRN first responders should upgrade or downgrade their level of respiratory protection only with the guidance and concurrence of the incident commander, or the safety officer or industrial hygienist in charge. Therefore, communication is critically important between CBRN first responders wearing NIOSH CBRN Combination Respirators with personnel responsible for deciding the appropriate mode of operation in changing CBRN incident environments.

However, if the SCBA mode of operation is lost while inside IDLH environments, CBRN first responders can escape using the least protective mode of operation, the NIOSH CBRN air-purifying respirator mode, which is twice as protective as CBRN air-purifying escape respirators. NIOSH CBRN air-purifying respirators are tested against the same representative test agents as general category CBRN air-purifying escape respirators; however, they are tested at twice the concentrations as CBRN escape respirators, which are normally 2, 3, or 10 times greater than IDLH concentrations.

NIOSH must establish equipment and instructional requirements for safe transition between the different modes of operation for CBRN first responders wearing NIOSH CBRN Combination Respirators inside hazardous environments. Recommend accomplishing this in the overarching CBRN Combination Respirator certification.

NIOSH Question: Should basic use training requirements be mandatory?

Respirator training objectives for CBRN first responders should be based on the training elements listed in paragraph (k) of reference (e) as they specifically relate to wearing respirators for protection against CBRN agents during first response to terrorist attack. In addition, the training must include specific respirator manufacturer's instructions concerning respirator inspection, maintenance, limitations, and respirator donning/doffing, including user seal checks. Particular attention must be placed on how and when to switch between modes of operation when wearing NIOSH CBRN Combination Respirators.

Reference (g) states that: *"To attain the proper respirator fit, seal and operational capability, end users should be trained, retrained and confident in using a CBRN SCBA before an actual response event occurs. In a well-defined respirator program users should know the UI [User's Instructions] thoroughly and practice donning, wearing and removing/doffing the CBRN SCBA to attain and maintain proficiency."* The above NIOSH quote also applies to training first responders to wear CBRN Combination Respirators during CBRN incidents.

Although OSHA policy requires annual respirator training, CBRN respirator program administrators and their assistants should highly encourage all personnel required to wear CBRN Combination Respirators to continue practicing the knowledge gained during annual CBRN respirator training, including frequently practicing donning their respirators and performing user seal checks to gain confidence in their ability to properly wear their respirators and to ingrain their understanding of how and when to switch between modes of operation when wearing NIOSH CBRN Combination Respirators.