Dragon, Karen E.

From: NIOSH Docket Office
Sent: Tuesday, April 05, 2005 3:03 PM
To: Dragon, Karen E.
Subject: FW: The SEA concern about NIOSH draft standard 200 Oct 2004

Karen--for processing.

-----Original Message-----
From: Dmitri Kazakov [mailto:Dmitri.Kazakov@seasafe.com.au]
Sent: Wednesday, March 30, 2005 6:19 PM
To: NIOSH Docket Office; zxf2@cdc.gov; Szalajda, Jonathan V.
Cc: Goran; Graham Powe
Subject: The SEA concern about NIOSH draft standard 200 Oct 2004

Dear Sirs

The SEA team would like to present the attached document for your attention.
We believe it may help you to further your standard development.

Best Regards

Dmitri Kazakov
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The SEA concerns about NIOSH draft standard.

All references are made to October 30, 2004 CBRN PAPR concept (Draft)

1. We believe NIOSH should verify maximum manufacturer claimed flow performance for the PAPR as one of the critical parameter PAPR system.
2. We believe it is incorrect to test PAPR filters at 300 l/min constant flow (paragraph 5.2, table 3, Breath responsive PAPR).
    a. SEA research team believes that the PAPR should be tested at maximum flow which is claimed by manufacturer divided to the number of filters.
    b. The filter consumption totally depends on the PAPR design. I.e. non-breath responsive PAPRs may consume air during exhalation or breathe responsive PAPRs may preserve the air during exhalation cycle, which significantly increases the filter life time. We believe that NIOSH should consider measuring the minute volume through the filters (interactive flow volume) and then performing the gas testing on this value; alternatively the gas testing should be performed on a real breathing machine.
3. The low temperature -30C tests
    a. Paragraph 4.3.1.2. Low Battery indicator

1. As the human breathing has irregular pattern it is almost impossible to predict negative pressure. We recommend replacing the sentence "*The indicator will also be capable of alerting the user prior to negative pressure condition...*" to "*The indicator will also be capable of alerting the user of a negative pressure condition...*"

b. Paragraph 4.3.1.3. Battery performance
   1. We have an inconsistency in test results following the described test method as the unit and battery's test temperature condition depend on preconditioning temperature, different battery mass, environment conditions etc. The pre-test conditioning affects the unit temperature during the tests.
      Example of different pre-condition environments: The battery is removed from battery charger just after charging cycle (Battery is warm), the battery is removed from battery charger a few hours after the charging cycle (Battery temperature is little higher than environment temperature), the battery is sitting at -30C before test etc.
      It is recommended that the unit be tested at -30C immediately after the charge is complete.
   2. We are concerned that the existing battery technology and some electronic components (such as pressure and flow sensors) may have a problem with the low temperature conditioning. For example according to the manufacturer specification the Hi-MH battery minimum temperature is -20C. Our preliminary experiments show that at -30C the battery internal resistance could be increased dramatically. At -30C 60% of the batteries would not be able to provide the current to start the motor and all of them experienced semi-permanent damage, which will require a few charge-discharge cycles to recover.

4. The test temperature variation during gas performance tests is also a concern. Our research shows high filter capacitance variation dependence from the temperature. Existing requirements stated the Gas capacitance test temperature 25+/-5C (Paragraph 5.2, table 2). I.e. filters may be tested at 20C or 30C. The results for such variation could be significantly different. Narrowing the temperature variation makes the test more repeatable. For example 25 +/-2C should be achievable in all labs today.
5. In regards to speech recognition testing. The maximum position of volume adjustment knobs does not provide the best speech recognition; users are given an opportunity to adjust the volume to find the optimum output level in regards to there voice spectrum and volume and thereby optimize the voice recognition for individual users. The user instruction should describe how to use this feature.
6. We believe that NIOSH should acknowledge that particles which may be emitted by internal components. A PAPR may produce (harmless) particles in concentrations that may affect the particle count test results. Due to this issue the amount of particles may be thousandths of times less than in the environment however the test method which is based on PortaCount or Photometry measurements may give a misleading assessment of the respirator's protection level. To overcome this, a background level should be established as part of the TIL testing.

Regards
Dmitri

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