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From: Sell, Robert [Robert.Sell@draeger.com]
Sent: Tuesday, September 30, 2008 1:47 PM
To: NIOSH Docket Office (CDC)
Cc: Szalajda, Jonathan V. (CDC/NIOSH/NPPTL)
Subject: 083-A - Subpart J SAR Revised Concept
Attachments: SAR Concept Comments - NIOSH Docket No 083 - Sept 2008.doc

Hello:

Attached please find Draeger Safety's comments on Docket #083. If there are any questions concerning these comments, please contact me.

Regards

Bob Sell

Sr. Project Engineer - Protection

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September 29, 2008

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Reference: DOCKET NUMBER NIOSH - 083
Proposed Concept: Supplied-Air Respirators (SAR) Standard; Subpart J
Dated July 1, 2008

Dear Sir / Madam:

Draeger Safety manufactures respirators for various markets and applications; therefore we offer the following comments in response to the NIOSH Proposed Concept: Supplied-Air Respirators (SAR) Standard; Subpart J, Dated July 1, 2008.

The following Draeger Safety comments are being submitted for consideration and we will comment step-by-step through the draft protocol:

Section 1 Scope:

Draeger suggests the addition of some new sections which detail the implementation period when the standard will take affect, grandfather clause for existing SARs which are already deployed in the field, and mandatory compliance with the new requirements.

Section 2 Definitions:

Draeger suggests that a "Definitions" section be added to the document and that these definitions follow those that have been either implemented by EN 132:1998 or utilize the proposed definitions as being finalized in the Draft International Standard ISO/DIS 16792 where the terms are commonly used.

Section 2.5:

We agree that this is a category for use as a method of supplying respirable air to the SAR, but we do not agree that the air source (portable blower/air compressor) should be a component of the respirator approval. We suggest that the definition be changed as follows:

Air Source Respirator - represents a ~~approved~~ respiratory protection system that ~~encompasses~~ utilizes a portable blower/air compressor supplying breathing air to the respiratory inlet covering. The approved respiratory system starts where the respirator connects to the portable blower/air compressor which supplies Grade D or better breathing gas to the respiratory inlet covering.

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Section 2.6

We do not agree that there should be a weight limitation for a portable blower/air compressor. If a system like this is desired, the employer should be able to determine their own logistics and provide the means to meet the needs of the application, Also, we do not understand the need to limit the number of users that can be supported by these systems and that it is the employers responsibility to ensure that the equipment meets the needs the respirator/user with recommendations from the manufacturer. Finally, we do not agree that pneumatic tools should be permitted to be used in conjunction with a respirator operating off of the portable blower/air compressor since the required CFM required to operate the tool will vary with the type of tool used. All pneumatic tools need to be operated by an air compressor that is independent of the respirator. We therefore suggest the following modifications:

Portable blower/air compressor - primary air supply for Air source respirators and designed as such that it can be located in the ~~carried to the~~ work location ~~by no more than two persons (100 lb maximum including accessories)~~ or rolled (manually or self-propelled) to the work location via a cart mounted system ~~(300 lb maximum including accessories).~~ This system may ~~supply a maximum of three users simultaneously (plus a pneumatic tool connection per user if so equipped~~) not be used to supply pneumatic tools.

Section 2.11:

Draeger suggests that this definition be replaced by the definition given in ISO/DIS 16972 because work rates will vary throughout the working shift and is dependent upon the activities being performed and light work can become heavy work just by increasing repetitions. We also suggest that the low work rate be removed and only proceed with a moderate and high work rate. The work rates will vary throughout a working shift and what may have been light work in the beginning of a shift can become a moderate or heavy rate by the end of the shift. Also, the daily work activities will vary and for an employer to maintain different respirators for various tasks seems to be a redundant and may lead to issues if the users keep using a respirator rated for a lower rate when they move to a task that requires a respirator for a higher work rate. We propose the section to be modified to:

Work Rate: Demand for breathable air by the wearer per time due to work load.

Section 3.1.1:

The respiratory inlet covering has already been defined in Section 2.10 and it is redundant to repeat the examples in this section. We propose the following:
Supplied-air respirator-Airline: A respirator equipped with a pressurized air hose which is used for entry into atmospheres not immediately dangerous to life or health, which utilizes a source of respirable breathing air and consists of an Airline hose, detachable

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coupling(s), control valve, orifice, pressure demand valve, an arrangement for attaching the hose to the wearer, and a respiratory inlet covering. ~~*usually consisting of a tight facepiece, loose hood, or helmet.*~~

Section 3.1.3:

The respiratory inlet covering has already been defined in Section 2.10 and it is redundant to repeat the examples in this section. In addition, this is the first time that "industrial plant or site-wide systems" has been introduced and we believe this is an unnecessary statement. We therefore propose the following:

Supplied-air respirator-Air source: SAR, for entry into atmospheres not immediately dangerous to life or health, which requires a portable blower/air compressor, air hose, detachable coupling(s), an arrangement for attaching the hose to the wearer and respiratory inlet covering. ~~*usually consisting of a facepiece, hood, or helmet. Systems capable of supplying respirable air to four or more users are considered "industrial plant or site-wide systems" and are not within the scope of this subpart.*~~

Section 4.1.1.2.7:

As noted in our comment for Section 2.6, we agree that this is a category for use as a method of supplying respirable air to the SAR, but we do not agree that the air source (portable blower/air compressor) should be a component of the respirator approval. We suggest that this requirement be removed from the document.

Section 4.1.3.1.2:

We currently do not understand the statement "where applicable, provide for holding a full facepiece in the ready position when not in use." When would this be applicable and who decides this? Since this is not a performance requirement we propose that this statement be removed and suggest the following:

Harnesses shall be designed and constructed to permit easy removal and replacement of respirator parts. ~~and where applicable, provide for holding a full facepiece in the ready position when not in use.~~

Section 4.1.3.3.2:

There are many applications where the Fire Service utilizes supplied-air respirators with or without an escape cylinder and manufacturer's may want to utilize a harness that meets the Fire Service requirements. We therefore suggest that a life safety harness certified to NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services is also included as an alternative safety/rescue harness certification. We propose the following modification:

4.1.3.3.2 Belts, rings, and attachments for life lines must withstand a pull of 227 kg (500 pounds) for 30 minutes without failure. If the harness is designed to act as a

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safety/rescue harness it shall meet the American National Standards Institute (ANSI) Z359.1 Fall Arrest Standard or the National Fire Protection Association (NFPA) standard NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services.

Section 4.1.5.2:
There are several categories identified in ANSI Z87.1-2003 and we would suggest that the specific sections be identified in this section. Some suggested sections are:

Face Shields: Section 9.2.1.1 – High Mass Impact
Section 9.2.2.1 – Drop Ball Impact
Welding Helmets: Section 10.2.2.1 – Drop Ball Impact
Section 10.2.2.2 – Plastic Lens Penetration Test
Full Face Respirators: Section 11.2
Loose Fitting Respirators: Section 11.3

We therefore propose the following wording and the addition of subsections to Section 4.1.5.2:

Section 4.1.5.2.1 Face shields shall be tested in accordance with ANSI Z87.1-2003, Section 9.2.1.1 – High Mass Impact and Section 9.2.2.1 – Drop Ball Impact.

Section 4.1.5.2.2 Welding helmet lenses shall be tested in accordance with ANSI Z87.1-2003, Section 10.2.2.1 – Drop Ball Impact and Section 10.2.2.2 – Plastic Lens Penetration Test.

Section 4.1.5.2.3 Full Facepiece Respirators shall be tested in accordance with ANSI Z87.1-2003, Section 11.2.

Section 4.1.5.2.4 Loose Fitting Respirators shall be tested in accordance with ANSI Z87.1-2003, Section 11.3.

Section 4.1.6:

Draeger Safety would like some clarification on the noise level requirements. The current wording implies that the noise level test will be performed on all SAR being certified and we are wondering if this only applies to hoods and helmets.

Section 4.2.1:

For consistency purposes, Draeger Safety suggests that a similar statement as Section 4.2.2.2 be also included as a subsection under Section 4.2 since these requirements also apply to the continuous flow respirator.

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4.2.1.X The manufacturer shall specify the range of air pressure at the point of attachment of the air-supply hose to the air-supply system, and the range of hose length for the respirator. For example, the manufacturer may specify that the respirator be used with compressed air at pressures ranging from 280-550 kPa (40 to 80 pounds per square inch) with from 6 to 76 m. (15 to 250 feet) of air-supply hose.

Section 4.2.1.2:

In order to allow multiple users to operate off of a compressor system there is a need to permit increased supply pressure to the point of attachment of the respirators. We suggest that the 125 psi requirement be increased to 145 psi and we put forward the following wording:

The specified air pressure at the point of attachment of the hose to the air-supply system shall not exceed ~~863~~ 1000 kPa (~~125~~ 145 pounds per square inch gage).

Section 4.2.1.3:

This section is permitting the pressure at the point of attachment to be greater than the 125 psi (or 145 psi as Draeger is requesting) therefore, the pressure relief system needs to be a component of the respirator and not the compressor system. We advocate changing this section to the following:

Where the pressure at any point in the supply system exceeds ~~863~~ 1000 kPa (~~125~~ 145 pounds per square inch gage), the ~~system~~ respirator shall be equipped with a pressure-release mechanism that shall prevent the pressure at the ~~hose connection~~ respirator from exceeding 863 kPa (125 pounds per square inch gage) under any conditions.

Section 4.2.2.3:

In keeping with our comment as noted in Section 4.2.1.2, to allow multiple users to operate off of a compressor system there is a need to permit increased supply pressure to the point of attachment of the respirators. We suggest that the 125 psi requirement be increased to 145 psi and we put forward the following wording:

The specified air pressure at the point of attachment of the hose to the air-supply system shall not exceed ~~863~~ 1000 kPa (~~125~~ 145 pounds per square inch gage).

Section 4.2.2.4:

As noted above in Section 4.2.1.3, this section is permitting the pressure at the point of attachment to be greater than the 125 psi (or 145 psi as Draeger is requesting)

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therefore, the pressure relief system needs to be a component of the respirator and not the compressor system. We advocate changing this section to the following:

Where the pressure at any point in the supply system exceeds ~~863~~ 1000 kPa (~~125~~ 145 pounds per square inch gage), the ~~system~~ respirator shall be equipped with a pressure-release mechanism that shall prevent the pressure at the ~~hose connection~~ respirator from exceeding 863 kPa (125 pounds per square inch gage) under any conditions.

Section 4.2.4:

With the exception of Section 4.2.4.6 all remaining sections should be deleted as a requirement for this concept standard. As noted in our comment for Section 2.5, air compressors for air source SAR should not be a component of the certification. The employer understands their needs and should be able to determine for themselves the air source for their applications and the air quality requirements have been dictated by OSHA in 29 CFR 1910.134(i). Therefore, we recommend the following:

4.2.4 Breathing gas for Air source SAR; minimum requirements;

~~4.2.4.1 Blowers/air compressors for Air source SAR shall be equipped with a CO alarm to warn the user if the CO concentration in the air supply is ≥10 ppm of CO.~~

~~4.2.4.2 The temperature of the air produced by the blower/air compressor for all Air source respirators shall not exceed 6 degrees Celsius above ambient as measured at the air entrance point of the respiratory inlet covering.~~

~~4.2.4.3 Must maintain positive pressure in the breathing zone of the respiratory inlet covering(s) at the manufacturer's specified work rate(s) as defined in Section 4.2.8.~~

~~4.2.4.4 Air source SAR shall be equipped with a filter between the portable blower/air compressor and the respiratory inlet covering(s) to effectively remove 95% of the particles from the breathing air.~~

~~4.2.4.5 The filter between the blower/air compressor and the respiratory inlet covering shall be easily replaceable by the user. The manufacturer's filter change-out scheduled should be followed (See: user instruction).~~

4.2.4.6 Compressors used to supply breathing air to air source respirators are constructed and situated to meet the requirements set forth in the 29 CFR 1910.134(i) "Breathing air quality and use".

Section 4.2.8.1:

In keeping with our comments above on removing the requirement for multiple certified work rates we suggest that this section be changed to:

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~~*The manufacturer shall specify the highest work rate from Table 2 for the intended use of the SAR system.*~~ *The SAR must maintain pressure above ambient in the face area and/or breathing zone of the respiratory inlet covering while properly mounted on a head form and operating at the manufacturer's minimum supply pressure and maximum hose resistance configuration* ~~*at each of the rates desired for approval*~~*.*

Table 2: NIOSH Approved Work Rates:

Draeger Safety believes that the optional low work rate listed should not be used and only the 40 Lpm and 57 Lpm works rate should be maintained. As noted in our comment for Section 2.11 above, the work rates will vary throughout a working shift and what may have been light work in the beginning of a shift can become a moderate or heavy rate by the end of the shift. Also, the daily work activities will vary and for an employer to maintain different respirators for various tasks seems to be a redundant and may lead to issues if the users keep using a respirator rated for a lower rate when they move to a task that requires a respirator for a higher work rate. We propose that Table 2 be also modified accordingly.

Table 2: NIOSH Approved Work Rates

Work Rate	*Minute Volume*	*Tidal Volume and Respirations*
~~*Low*~~	~~*25 Lpm*~~	~~*1.30 liters @19.2 respirations per minute*~~
Moderate	*40 Lpm*	*1.67 liters @ 24 respirations per minute*
High	*57 Lpm*	*1.95 liters @ 29.1 respirations per minute*

Section 4.2.9.5:

Include dual values were applicable and we put forward the following:

The respirator shall be tested at a temperature of 25 ± 5°C (77 ± 9°F).

Section 4.2.11:

We suggest that the number of test subjects and facial size information be included as a subsection to this section.

Section 4.2.11.1:

In keeping with our position on multiple work rates we propose that this section delete this wording along with some other minor modifications to the text.

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The measured LRPL for SAR shall be determined with the respirator operating and donned ~~in the candidate approval design mode~~ as described in the ~~applicable~~ manufacturer's user instructions ~~at the manufacturer's specified work rate as described in Section 4.2.8.~~ The minimum LRPL values are as follows:

Section 4.3:

As noted above in our comments on that portable blowers/air compressors should not be included in the certification SAR respirators we advocate the removal of this entire section.

Section 4.4.3.6 and Section 4.4.3.7:

Currently we do not understand the need to test permeation resistance with the three substances that are currently identified. Permeation of substances is dependent upon the solubility, diffusion, and chemical structure. Solubility increases with higher molecular weight and diffusion decreases with higher molecular weight and hydrocarbons in the range of C7 have the maximum permeability capacity. In reviewing the three substances being considered, we find that Kerosene consists of hydrocarbons in the range of C12 - C15, gasoline consists of hydrocarbons in the range of C5 – C12, and Toluene is a pure substance with exactly C7. From a permeation aspect, Kerosene is less critical than gasoline and Toluene and will provide no additional benefits when used for testing. Gasoline will be the more critical test than Toluene since gasoline is comprised of a mixture of different substances and we believe that the use of gasoline should be sufficient. In addition, at least the grade should be identified and if the selected grade is so specific a source or other information should also be provided in order that it can be obtained. We suggest removing Section 4.4.3.6 (toluene) and Section 4.4.3.7 (kerosene) and only use gasoline.

Section 5.1.2:

There has been a trend within various industries that is starting to question the reasoning concerning the identification of duration (i.e.: 5, 10, 15, etc. minute rated duration) versus a capacity rating for the cylinder. We would suggest that a capacity rating start to be considered and implemented which is based upon the volume or water capacity of the cylinder. This would enable the user to calculate the duration based upon the actual work rate during use derived from the risk assessment analysis that the employer needs to perform. This approach will eliminate the misunderstanding that a 10 minute rated cylinder did not last 10 minutes due to the high demands of the wearer by breathing intensively even though the cylinder has been certified and marked as a 10-minute set. Therefore, we propose the following:

Incorporation of an ~~5, 10-minute or longer duration~~ escape air cylinder with enough

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capacity to permit an egress of 5 minutes, 10 minutes or longer based on the high work rate as defined in Section 4.2.8, with air hose supply during entry.

Section 5.1.3:

There has been a trend within various industries that is starting to question the reasoning concerning the identification of duration (i.e.: 5, 10, 15, etc. minute rated duration) versus a capacity rating for the cylinder. We would suggest that a capacity rating start to be considered and implemented which is based upon the volume or water capacity of the cylinder. This would enable the user to calculate the duration based upon the actual work rate during use derived from the risk assessment analysis that the employer needs to perform. This approach will eliminate the misunderstanding that a 15 minute rated cylinder did not last 15 minutes due to the high demands of the wearer by breathing intensively even though the cylinder has been certified and marked as a 15 minute set. Therefore, we propose the following:

Incorporation of an ~~15 minute or longer duration~~ escape air cylinder with enough capacity to permit an egress of 15 minutes or longer based on the high work rate as defined in Section 4.2.8, allowing not more than 20 percent of the rated cylinder capacity of air supply to be used during entry into a hazardous area.

Section 5.1.6:

As noted in our comment for Section 2.6, we do not feel that pneumatic tools should be permitted to operate from the same compressor system that the respirator is using unless there is a definite separation and controls to ensure that the respirator function is not compromised by the operation of the pneumatic tool. We suggest the following modification to the statement.

The connection between the air hose and the rest of the respirator shall be such that breathing air from the cylinder shall only flow to the tight fitting respiratory inlet covering and shall not flow back through the supply air hose. ~~or pneumatic tool connection if so equipped.~~

Section 5.1.7:

In addition to requiring an automatic switch to the compressed air cylinder, an option for automatically switching back to air line supply, if it should be restored along, with visible or audible notification that the system has returned to normal should be considered as an optional feature with testing and verification requirements. We are providing some possible text that may be used to cover this feature.

Section 5.1.7.2 Supplied breathing air, as an option, can be automatically restored

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once the situation has been corrected and the respirator will automatically switch to the air line supply and turn off the available SCBA integrated breathing air cylinder source. This shall occur without loss of air pressure to the user and with no detectable inward leakage of contaminants.

Section 5.1.8:

In keeping with our comment for Section 5.1.7.2, we propose that this section be modified to allow for this option.

An alarm providing an indication that the system is on cylinder air or has been restored to supplied air mode shall be readily visible (via light) or detectable (via sound or vibration) to the user without manipulation of the respirator and without affecting protection and performance.

Section 5.2.2:

As noted in our comment for Section 4.1.5.2, there are several categories identified in ANSI Z87.1-2003 and we would suggest that the specific sections be identified in this section. Since a tight fitting respiratory inlet covering has been stated as a requirement for Enhanced SAR/SCBA we would suggest ANSI Z87.1-2003, Full Face Respirators: Section 11.2 be imposed as the requirement and propose the following wording:

Section 5.2.2.1 Tight Fitting respiratory inlet coverings shall be tested in accordance with ANSI Z87.1-2003, Section 11.2 – Full Face Respirators.

Section 7.2:

As noted above in comments for Section 2.6 and Section 5.1.6, pneumatic tools should not be permitted to operate from the same system as the respirator and this entire section should be deleted.

General Comments:

As part of the development of this concept standard Draeger Safety would like to learn more information concerning the approval and certification of these types of products:

1. Will a new schedule number be assigned to supplied air respirators or will the same TC-19C schedule be maintained?
2. Will a new schedule number be assigned for those respirators that are approved with escape cylinders or longer duration cylinders or will the same TC-13F schedule be maintained?

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3. For those respirators approved with escape cylinders or longer duration cylinders will the duration of the respirator be identified or would a capacity rating be applied to the respirator?

Draeger Safety thanks NIOSH for the opportunity to provide comments. Please consider our comments concerning the ongoing changes to the standard.

If there should be any questions concerning this matter, please do not hesitate to contact me at 412-788-5685 or via e-mail at Robert.Sell@Draeger.com.

Respectfully,

Robert Sell

Robert Sell
Sr. Project Engineer

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