CAROLINA DEPARTMENT OF LABOR
OFFICE OF OCCUPATIONAL SAFETY AND HEALTH
RALEIGH, NORTH CAROLINA

Chapter 7

Subchapter 7D

NC-OSHA Field Information System Part III Standards Notice 55

Facial Hair and Respirator Use

A. Standard

29 CFR 1910.134(e)(5)(i) Every respirator wearer shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skullcap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's facepiece fitting instructions.

B. Discussion

The purpose of a respirator is to protect the user from airborne hazards. When respirators are required, the type of respirator worn and the manner in which it is worn must be:

1. Suitable for the hazards to which the wearer may be exposed,
2. Consistent with the manufacturer's design and usage parameters,
3. Consistent with the National Institute for Occupational Safety and Health (NIOSH) approval criteria. In performing facepiece fit-testing for respirator certification, NIOSH uses only clean-shaven individuals,
4. Consistent with the requirements for a minimally acceptable program as described in 29 CFR 1910.134(b), and
5. Consistent with the requirements in 30 CFR Part 11 concerning selection, fit, use and maintenance of an approved respirator.

Research has shown conclusively that facial hair can interfere with proper fit of respirators, and thus protection afforded. Beards, mustaches, sideburns, and

goatees can cause two main problems with respirator use: (1) prohibit an adequate facepiece-to-face seal, and (2) interfere with the operation of the facepiece exhalation valve.

Several factors influence the performance of a respirator when the wearer has facial hair. These include the physical characteristics of the facial hair, i.e. coarseness, length; the type of respirator, i.e. full-face, half-face, brand; and day-to-day facial hair growth. Generally speaking, shorter, coarser facial hair causes a poorer respirator fit.[1]

Facial hair between the facepiece of the respirator and skin can prohibit the facepiece from sealing with the skin. Pulling the respirator straps tighter does not normally provide an adequate fit because the facepiece shape is distorted and leaks can develop. Also, excessively tightened straps can cause discomfort for the wearer who will likely loosen them during the period of wear, changing the facepiece fit. Using petroleum jelly or other viscous material to seal the respirator to the face normally is not effective because of the difficulty and employee aversion to using such a substance.

Another problem encountered is that long facial hair can be positioned between the exhalation valve and exhalation portal. This would cause the exhalation valve to be stuck in the open position and a leak would occur during inhalation.

Skretredt and Loschiavo found in a recent study of 370 male workers that for employees with facial hair, there was a 246 fold drop in protection for employees wearing half-mask negative-pressure respirators and a 330 fold drop in protection for employees wearing full-face negative-pressure respirators. Their conclusion was that this leakage is unacceptable and that facial hair should not be permitted when employees are required to wear negative-pressure respirators.[2]

Even for an air-supplied respirator such as airline or positive pressure self-contained breathing apparatus (SCBA), there can be a problem. A wearer -if such a device can overbreathe the air supplied when moderately heavy to heavy workloads are performed. If there is inadequate sealing of the -facepiece, the air contaminant can be pulled inside tile facepiece. This would also shorten the service life of the air supply for an SCBA. This problem would also occur when powered-air purifying respirators (PAPR) such as MSA's PAPR or 3M's Airhat Brand are used.[3]

Respirators used for emergency escape are also affected by facial hair or- other conditions that prohibit a good fit. Employees who must depend upon a

facepiece-to-face seal during escape would encounter the afore-mentioned obstacles to a good fit. If a bag-type escape apparatus that covers the entire head is depended upon, a long beard that prohibits the bag from adequately fitting around one's neck would create leaks and interfere with the speed at which the respirator must be donned.

NOTICE: North Carolina's Division of Occupational Safety and Health recognizes that there are NIOSH-approved respirators, such as Type C and air-purifying hooded respirators, that can be worn with facial hair in many situations. The scope of this Standards Notice is not to include a discussion of these various situations; however, assistance can be obtained from our Bureau of Education, Training and Technical Assistance at (919) 733-4880.

C. Other Authorities' Interpretations

National consensus standards and organizations have addressed this problem and prohibit facial hair when respirators are worn: ANSI Z88.2-1980, NIOSH - A Guide to Industrial Respiratory Protection, the Department of Energy and Nuclear Regulatory Commission, and the U.S. Navy.

D. Conclusion

Based upon available scientific knowledge, North Carolina's Division of Occupational Safety and Health has determined that facial hair between the skin and respirator sealing surface is a condition that prevents a good face seal and is a violation of 29 CFR 1910.134(e)(5)(i).

A positive quantitative or qualitative fit-test is not acceptable evidence that would allow a respirator to be worn when facial hair is between the skin and respirator sealing surface or when facial hair could interfere with the operation of the exhalation valve.

However, in the event that a positive-pressure respirator is approved by the National Institute for Occupational Safety and Health for use where facial hair is between the face and respirator facepiece sealing surface, the North Carolina Division of Occupational Safety and Health will re-evaluate its position.

[1]Hyatt, E.C., et al., "Effect of Facial Hair on Respirator Performance, American Industral Hygiene Association Journal, Vol. 34. No. 4. April, 1973, pp. 135-142.

[2] Sketredt, O.T., and J.G. Loschiavo, "Effect of Facial Hair on the Face Seal of Negative-Pressure Respirators" American Industrial Hygiene Association Journal, Vol. 45, No. 1, January 1984, pp. 63-66.

[3]Held, Bruce J., "Facial Hair and Breathing Protection," The International Fire Chief, December, 1980, pp. 25-28.

David J. Pierce, Chief
Education, Training and Technical Assistance Bureau

Michael D. Ragland
Deputy Commissioner for Health and Safety

Signed on original