

Using Disposable Respirators In a Radiological Protection Program

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Introduction

I hear from time to time from RSOs that they either have no official respirator program; or that they have an OSHA.-compliant¹ respiratory protection program but do not use respirators as part of their radiological protection program. Many, however, allow that they DO use disposable dust masks for certain radiological operations or for emergencies. We have to be careful here. Use of dust masks, disposable respirators, filtering facepieces, or maintenance-free respirators—call them what you will—IS COVERED by both OSHA and NRC regulations. Also, an OSHA-compliant program must contain some additional elements to be NRC-compliant. These include ALARA, hazard monitoring, contamination control and dose assessment. This article contains information to keep RSOs out of regulatory difficulty in the “dust mask” respirator area.

Not All Dust Masks Are Created Equal

OSHA (and ANSI²) lump all these devices into the “half mask” category. They even include the so-called ¼ masks. Quarter-facepiece respirators (Figure 1) seal over the bridge of the nose, around the cheeks, and *between the point of the chin and the lower lip*, not under the chin as half-facepieces do. Especially in those equipped with only a 2-point suspension, it has been observed that the fit becomes unstable when the



Figure 1. Typical quarter mask respirator.

wearer moves around in the work place, especially when the wearer talks.³

The NRC makes a distinction⁴ between what they call “filtering facepiece” respirators (in which the filter medium is an integral part of the facepiece structure and is not replaceable) and half-face respirators. In order for one of these disposable devices to be considered a half-facepiece respirator in an NRC program, it must have *both* of

two design characteristics:

- Seal-enhancing rubber or elastomeric material applied to the *entire* face-to-facepiece seal area, and
- An *adjustable* four-point (minimum) suspension strap system.

Many, but not all of these that qualify as half-face respirators also have exhalation valves. See Figure 2.

You can think of these as two tiers of disposable masks. The “Upper Tier” contains those that most closely emulate a “standard” rubber facepiece and are considered to be half-face respirators by the NRC. The “Lower Tier” contains what have historically been referred to as “dust masks.” Why the NRC decided to create two categories where OSHA has one is not known.

¹ The Occupational Safety and Health Administration.

² The American National Standards Institute, Z88.2-1992.

³ These devices have always been, and continue to be prohibited in an NRC-regulated respirator program (10 CFR 20 Appendix A, footnote e).

⁴ Regulatory Guide 8.15-1999, Sections 4.7 and 4.8.

In an NRC program, the Upper Tier respirators are *always* considered to be half-face respirators. As such, those who intend to wear them (even in an emergency) need to be medically screened, trained and fit tested. No exceptions are mentioned. Lower Tier disposables may be used on a voluntary basis as described below; or, if the wearer is trained, medically screened and fit tested, Lower Tier devices can also be used as a half face respirator with an assigned protection factor (APF) applied.

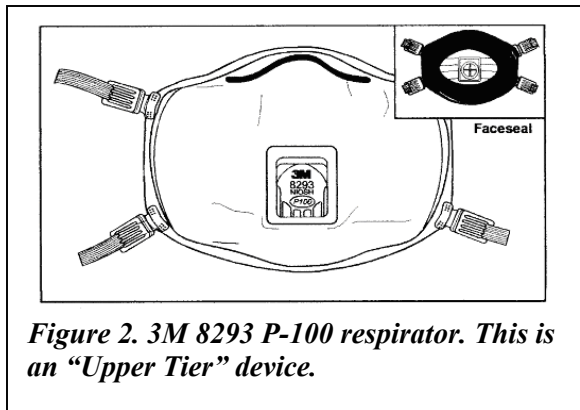


Figure 2. 3M 8293 P-100 respirator. This is an “Upper Tier” device.

Voluntary Respirator Use

OSHA permits individuals to use respirators in situations where a safety and health assessment shows that they are not necessary, but where individuals want to wear them anyway. These people are referred to as “voluntary” respirator users.⁵ See Figure 3. Volunteers do not have to be fit tested or medically screened, and only need to be trained in accordance with 29 CFR 1910 Appendix D (see Figure 4), which is quite minimal. NRC permits voluntary respirator use also, but stipulates that only the Lower Tier of dust masks may be provided for voluntary respirator use. So, voluntary use of lower tier disposable respirators is permitted in radiological areas. Obviously no APF credit is taken since exposure should be minimal or zero based on the pre-work assessment.

⁵ 29 CFR 1910.134(c)(2)(i) and (ii).

Individuals who are *required* to wear any type of respirator, or where respirator use is “suggested,” *are not* volunteers. If a procedure requires or suggests the use of a dust mask, the individual must meet the medical screening, fit testing and training requirements of an OSHA and NRC program, and the radiological aspects must also be addressed.

Conclusion

Radiation Safety Officers need to be aware of the nuclear respiratory protection requirements and guides⁶ before they permit or require the use of respirators for radiological protection. NRC recognizes that an OSHA-compliant respiratory protection program fulfils its requirements, so long as the radiological aspects are also addressed. These would be primarily contamination control, internal dose assessment and ALARA.

Voluntary users must be truly volunteers, and even they need some documented training. If a credible incident could produce airborne radioactive material to the extent that respirators (even disposable respirators) are specified in your re-entry, recovery or decontamination procedures, you should supplement your OSHA respirator program to include the radiological aspects, thus ensuring a nuclear-compliant respiratory protection program.

⁶ 10 CFR 20 Subpart H; Regulatory Guide 8.15-1999; and NUREG/CR-0041 Rev. 1, January 2001.

1910.134(c)(2)(i)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section (“Information for Employees Using Respirators When Not Required Under the Standard”); and

1910.134(c)(2)(ii)

In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. Exception: Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).

Figure 3. OSHA regulations for voluntary respirator use.

Appendix D to Sec. 1910.134 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else’s respirator.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

Figure 4. Appendix D to 29 CFR 1910.134.