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File-Respirators



Organization Resources
Counselors, Inc.

Memorandum

March 22, 1983

To: ORC Respirator Task Force

From: Darrell K. Mattheis

Subject: Draft Response To OSHA's ANPR on Engineering Controls
vs. Respirators

Enclosed is the initial draft of a response to OSHA on their ANPR for engineering controls vs. respirators. This is intended to be the starting point for our discussions on April 5, and is by no means final. You will notice that I have not attempted to answer all questions. Some we may chose to ignore totally, others, we should try to answer with actual examples drawn from individual company experience.

The more preparation we do prior to the meeting, the more we will accomplish on the 5th of April. If you could bring along some examples of situations that might be included in the ORC reply to OSHA it would be appreciated. In any case, I will be looking forward to seeing you on the 5th in Wilmington, Delaware, in the DuPont Building, (same building as the DuPont Hotel) room 5045, 1007 Market Street at 10:00 a.m. Bob Martin's number is (302) 774-4825.

Darrell K. Mattheis

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Engineering Controls vs Respirators

Introduction

Before beginning with the listing of its questions, OSHA notes that "In the questions that follow, the term engineering controls is intended to include the use of administrative or work practice controls." It is important that OSHA understand from the beginning that common industry usage does NOT include administrative and work practice controls as part of "engineering controls" and to so include them here distorts the issue and confuses the discussion. Therefore, in the answers that follow, it must be clearly understood, that when we speak of "engineering controls" we DO NOT include administrative and work practice controls.

Regardless of the exact means used to provide protection, the most effective way to improve workplace safety and health is by means of an integrated program, incorporating the full spectrum of knowledge in the area of occupational safety and health. This range would normally extend from a written corporate policy and program down to the use of personal protective equipment. No single element of a sound integrated safety and health program is as effective by itself as it is when functioning as a part of the whole system. No element, whether it be ventilation, respirators, or medical surveillance can do the whole job by itself.

Engineering controls are a part of the control spectrum as are respirators, and taken by themselves, it is unlikely that they can be entirely successful. Administrative and work practice controls are important parts of an integrated program, and they are useful tools for the concerned manager.

To lump a whole segment of management tools, such as administrative and work practice controls in with engineering controls, implies that they cannot be used with any other approach. OSHA's definition of engineering controls means that if one disagrees with the present regulatory reliance on engineering controls, one must also disagree with the use of administrative and work practice controls, which does not make good sense. Engineering, work practice, and administrative controls, and the use of personal protective equipment must all be viewed as tools to be used by the safety and health manager. An effective safety and health program makes use of any and all tools in the combination that produces the maximum benefit for the time and money expended. Work practice and administrative controls can and will be applied to the use of respiratory protective equipment just as they are to engineering controls, but each control must be evaluated on the basis of what it can contribute to the whole effort. Lumping a number of controls together makes it difficult to do a proper evaluation of their potential contribution and should thus be avoided.

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Engineering Controls Vs. Respirators

In answering OSHA's questions, we have not always attempted to answer exactly the questions that OSHA asked or even all the questions. In general, we have attempted answers where we felt that they would contribute to the understanding of the topic. Some of the questions are such that only specific examples can be used to answer them and these we have left for the Task Force. For many of the questions, specific examples illustrating our answer are the best approach. We would like to ask that all of you consider examples from your experience that can be used to strengthen our answers to these questions.

1(a) SHOULD OSHA REQUIRE THE USE OF FEASIBLE ENGINEERING CONTROLS IN PREFERENCE TO THE USE OF RESPIRATORS?

Answer: It is almost always wrong to require that a single approach be used in the solution of a problem. Engineering controls should always be considered when one is searching for an appropriate solution to an exposure problem. However, engineering controls are not always the only or the best solution in every situation. Each situation must be evaluated on its own merits, and the competent professional concerned must make a decision on the best way to proceed. Means for achieving the protection of exposed employees should be left up to the discretion of the employer.

1(b) WHAT FACTORS INDICATE THAT ENGINEERING CONTROLS IN THE WORKPLACE BETTER PROTECT EMPLOYEE HEALTH?

Answer: One cannot say with any assurance that engineering controls provide better protection of employee health. The effectiveness of any system used to protect employees from possible exposure to toxic substances is dependent upon the quality of the safety and health program that exists in that workplace. Engineering controls by themselves are not likely to provide employee protection superior than that supplied by respirators. Engineering controls, as respirators, are most effective when used as part of an integrated program. Such an integrated program makes use of whatever means are best suited to the solution of the problem, and usually uses them in combination.

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1(c) WHAT FACTORS INDICATE THAT RESPIRATORS IN THE WORKPLACE PROVIDE BETTER PROTECTION OF EMPLOYEE HEALTH?

Answer: Respiratory protection can provide high quality protection of employee health under some circumstances, but should not be considered in isolation. The selection of the right combination of controls to be used in a particular workplace must be done by the competent professional on the scene. It cannot be decided on a generic basis.

1(d) ON WHAT BASIS COULD ONE CONCLUDE THAT IN SOME GIVEN SITUATION, ENGINEERING CONTROLS AND RESPIRATORS PROVIDE A DEGREE OF PROTECTION THAT IS EQUAL OR INDETERMINATE?

Answer: Since workplaces and situations vary widely, the choice of controls and their proportional contribution to the solution of the problem must be determined by the competent professional on the scene. The only final outcome that is important is that exposed employees are protected. Whether the means to the desired end are equivalent or not, is of small consequence.

1(e) WHAT FACTORS ABOUT A PARTICULAR SITUATION INDICATE THAT RESPIRATORS WILL GIVE PROTECTION AT LEAST EQUAL TO THAT PROVIDED BY FEASIBLE ENGINEERING CONTROLS?

Answer: Since particular situations differ widely, only the competent professional on the scene can make such a decision. There are, however, a number of things that may enter into such a decision:

Engineering Controls

1. Proper design and installation.
2. Proper use, (turn on, position flexible duct near work etc.)
3. Surveillance (performance tests, air monitoring, biological monitoring.)
4. Maintenance (p.M. for belts, bearings, blades, etc.)

Respirator Program

1. Existence of a written program.
2. Industrial Hygiene monitoring results used as the basis for selection of respirator type.
3. Biological monitoring: Urine, breath, blood.
4. OSHA Form 200 Log: How well kept, up to date, etc.

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Respirator Program (Continued)

5. Training program: Documented.
6. Employee surveys.
7. Enforcement of program as written; Records of actions.
8. Storage, cleaning, maintenance facilities: sign-off sheets for the above.
9. Fit-testing: Documentation of procedures and signature of each employee fitted and the date.
10. Evaluation of the physical condition of the respirators.
11. Use of respirators in the workplace: Are employees using the right kind of respirators at the right times and places?
12. Records of dual sampling: Simultaneous sampling inside and outside of the respirator facepiece. Active or passive (dosimeter) sampling.

Data on working protection factors submitted to OSHA by the DuPont Company show that with an adequate respirator program, good protection from airborne chemicals is provided.

For engineering controls to be effective, they must be designed, installed, monitored and maintained properly. Improperly designed or installed engineering controls will likely be just as inadequate as improperly selected or used respirators. Just as continual surveillance is required for a respirator program, it is also required for an engineering control program. Such surveillance includes special air monitoring around vessel seals, ports, and other controlled or ventilated potential sources of contaminant release. In addition, air flow checks must be made to insure that ventilation rates are maintained at adequate levels. Where discrepancies are found, actions must be quickly taken to check fan speeds, drive belts, duct work and other system components for defects and make appropriate corrections.

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In summary, just as an effective respirator program requires proper selection, use, surveillance, and maintenance, an effective engineering control program requires proper design, installation, surveillance, and maintenance. In situations where engineering controls are not effective due to infeasibility of design or installation, an effective respirator program will provide better protection.

In addition, an engineering control may fail as readily as a respirator program if surveillance and maintenance are inadequate.

1(d) ON WHAT BASIS COULD ONE CONCLUDE THAT IN SOME GIVEN SITUATION ENGINEERING CONTROLS AND RESPIRATORS PROVIDE A DEGREE OF PROTECTION THAT IS EQUAL OR INDETERMINANT?

Answer: Comparison of biological monitoring data would be the best basis to determine relative effectiveness. If, for example, blood leads are the same under the two control regimens, the protection is equivalent. Where biological monitoring methods are not available, equivalency might also be shown by respirator use factor studies which would determine the TWA reduction in concentrations of a contaminant inside respirators relative to ambient levels achievable by engineering controls.

1(f) ARE THERE REASONS TO PREFER THE USE OF ENGINEERING CONTROLS OVER THE USE OF RESPIRATORS DESPITE ANALYTICAL DETERMINATIONS THAT YIELD INDETERMINATE OR EQUAL RESULTS CONCERNING THE DEGREE OF PROTECTION AFFORDED?

Answer: There are none which are pertinent to OSHA standards. Medical approval for respirators use prevents excessive stress during use which might present a health hazard. Other significant considerations include the preference of employees not to have to wear respirators or some discomfort to the face from respirator contact when respirators are worn. These are valid employee relations considerations as are concerns over length and number of breaks and paid shower time. As such, they are items negotiable between employees and employers. However, they are not pertinent to employee health, and therefore, should not be addressed in an OSHA standard.

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2. IN DECIDING ON THE USE OF ENGINEERING CONTROLS OR RESPIRATORS FOR A PARTICULAR SITUATION, OR IN GENERAL, HOW SHOULD OSHA OR THE EMPLOYER TAKE THE FOLLOWING FACTORS INTO ACCOUNT? (a)-(n)

Answer: Every situation has a multitude of unique individual factors that need to be taken into consideration before one can choose the proper mix of controls necessary to prevent undue employee exposure. The final judgement must be made by the competent professional on the scene. There is no way that OSHA can draw up a list of factors, check them off, and say yes or no. Additionally, in most situations there is no clear selection of a single superior way to proceed. In most cases the final solution will be a combination of control strategies, the exact proportion of which will depend on the changing mix of conditions in the workplace at any given time.

Most employers lack the professional knowledge and or experience to explicitly make the kind of judgement and choices that OSHA's questions assume. Given the validity of the foregoing statement, we must assume that this ANPR is directed at the minority of business organizations that have the services of professional industrial hygienists or safety specialists.

When one considers the small number of employers that have used the services of a professional industrial hygienist or safety specialist, it immediately becomes clear that the population to which this ANPR is directed consists of those who read the Federal Register, and who have both the skill and resources to respond effectively to it.

If OSHA wants to have any guarantee that a detailed professional evaluation is done for each situation where respirators might be used in place of or in conjunction with, engineering controls, they should consider restricting such a choice to those organizations that either have professional industrial hygienists or safety specialists on their staffs, or who have contracted for their services. This, of course, leaves the approximately 96 percent of U.S. employers who lack such professional services.

Most worksites where respiratory protection is presently being used lack any kind of organized respirator program. Engineering controls, where they exist, are often installed by guess or estimate and no one, employees or employer, has any idea of how effectively they work.

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OSHA has a legal and moral obligation to, at least, attempt to assist that part of the employer population that lacks the skill and resources to properly implement an appropriate program of respiratory protection or engineering controls. The kind of questions being discussed in this ANPR are entirely irrelevant to the employer population we are here discussing, but their needs and those of their employees are of the highest relevance to OSHA's responsibilities under the OSH Act. OSHA must give the most serious consideration to means and methods to reach and interact with that part of the employer population most in need of assistance.

3. THE COMPARISON OF ENGINEERING CONTROLS AND RESPIRATORS CAN BE BASED ON THE POSSIBLE LAPSE OF PROTECTION DUE TO DEFECTS OR MALFUNCTIONS AND ON EMPLOYEE ACCEPTANCE.

Answer This is a poor basis for a comparison of the two systems of control being considered. Both engineering controls and respirators are most effective when they are implemented as part of an integrated program of safety and health protection in the workplace. For more details, see our answer to question 1 of this section.

- 3(a) HOW ARE THE RESPECTIVE PROBABILITIES OF PROTECTION FAILURE TO BE ASSESSED?

Answer Both systems can and do fail, both need careful programs of maintenance and surveillance, both need testing and certification, and final effectiveness for both is dependent on the conditions and circumstances of use.

- 3(b) HOW ARE THE RESPECTIVE CONSEQUENCES OF PROTECTION FAILURE TO BE ASSESSED?

Answer Engineering controls may fail and not be detected for weeks or months. When engineering controls fail ALL employees who depended on those controls are exposed. Respirators on the other hand are unlikely to fail massively, but rather individually, and rarely will they cease to offer any protection. Most respirators even when not operating properly, or not used correctly, will still provide a degree of protection sufficient to bring exposure below the PEL. Respirators generally have a built in margin of safety because the environments

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where respirators are used usually have containment concentrations only two to three times higher than the PEL, and even a poorly fitting respirator will give protection of five times the PEL.

- 3(c) HOW ARE ENGINEERING CONTROLS AND RESPIRATORS TO BE COMPARED WITH RESPECT TO THE DEGREE OF WARNING CONVEYED TO THE AFFECTED EMPLOYEES WHEN PROTECTION LAPSES?

Answer Again, much depends on individual circumstances such as the nature of substance, the kind of engineering controls, the existence of integrated safety and health programs and more. In general, protection is unlikely to lapse completely with respirators, and since respirators have a built in safety margin, they will often continue to give adequate protection even when not used correctly. If the substance has a warning scent both respirator users and those working with engineering controls will be aware of a lapse in protection. With ventilation system, one of the most common forms of engineering controls, the effectiveness of the system often degrades slowly but steadily as filters become clogged, and the ductwork collects obstructing layers of dirt and product. When a ventilation system degrades over time, the employees exposure may steadily increase without their being aware of it. In both cases, the only guarantee of system effectiveness is the existence of a comprehensive, integrated safety and health program in the organization.

- 3(d) HOW CAN EMPLOYERS ENSURE EMPLOYEE ACCEPTANCE OF RESPIRATORS?

Answer Employee acceptance is always a problem with respirators, however, a good integrated health and safety program with education, training, enforcement and audit can assure that a respirator program gives the protection it was designed for.

4. IS IT PRACTICAL TO COMPARE IN GENERAL TERMS THE OVERALL EFFECTIVENESS OF ENGINEERING CONTROLS AND RESPIRATORS?

Answer It is not practical to compare in general terms the overall effectiveness of engineering controls and respirators. Respirators may vary greatly in the amount of protection they provide. For example, OSHA considers various respirators to provide the following protection factors (PF):

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<u>Respirator</u>	<u>PF</u>
Quarter mask, air purifying	5
Half mask, air purifying	10
Full face mask, high efficiency	50
Half mask, atmosphere supplying (supplied air)	1,000
Pressure demand, full face, SCBA	10,000

In the same way engineering controls vary in effectiveness:

<u>Engineering Control</u>	<u>Equivalent PF*</u>
Poorly designed exhaust canopy	1
Well designed vessel port exhaust	10
Well designed dust bagging device	1,000
Well designed laboratory hood	100,000

*Airborne concentration before installation/airborne concentration after installation. (Data from E.I. DuPont de Nemours & Co.)

With this wide variation in effectiveness of both respirators and engineering controls, it is not practical to specify one type as being superior to another. For a given application, the effectiveness of a specific type of respirator, e.g., half mask air purifying, can be compared with a specific type of engineering control, e.g., well designed vessel port exhaust using protection factors.

5. CAN THE PERFORMANCE OF ENGINEERING CONTROLS BE PREDICTED ACCURATELY AT THE DESIGN STAGE? EXPLAIN.

Answer If the system is being designed by an experienced individual or group, and if there is accurate data available about the levels of contaminants that one wishes to protect against, it is possible to predict within certain limited ranges what the performance may be.

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5(b) CAN THE EFFECTIVENESS OF ENGINEERING CONTROLS BY DESCRIBED ACCURATELY FOR LARGE CLASSES OR GROUPS OF CONTROLS OR OPERATIONS AND PROCESSES CONTROLLED? EXPLAIN.

Answer See our response to question 4.

6(a) IN INSTITUTING AN EMPLOYEE PROTECTION PROGRAM BASED ON RESPIRATORS, WHAT SOURCES OF INDIRECT OR HIDDEN COSTS ARE THERE, IN ADDITION TO THE OBVIOUS DIRECT COSTS?

Answer If the organization in question already has an effective integrated health and safety program the increase in costs will be incremental. The biggest "hidden" cost will be in the area of employee relations.

6(b) WHAT ARE THESE COSTS ON A PER EMPLOYEE BASIS AND ON A PLANT WIDE BASIS?

Answer We need examples from the Task force for this answer.

6(c) WHAT ECONOMIES, EITHER DIRECT OR INDIRECT WILL BE REALIZED FROM THE INSTITUTION OF SUCH A PROGRAM (OTHER THAN AVOIDANCE OF ENGINEERING CONTROL COSTS)?

Answer This is best answered with examples supplied by the Task Force.

7(a) IN INSTITUTING AN EMPLOYEE PROTECTION PROGRAM BASED ON ENGINEERING CONTROLS, WHAT SOURCES OF INDIRECT OR HIDDEN COSTS ARE THERE IN ADDITION TO THE OBVIOUS DIRECT COSTS?

Answer In discussing engineering controls there are three general levels that must be distinguished: (1) Design changes in new installations, (2) Enclosure on existing machinery or installation, (3) Installation of ventilation systems on a retrofit basis. For 2 and 3 the costs are mostly direct, with some losses due to increased difficulty of operation and maintenance, and a possible deleterious effect on product quality and efficiency.

For many sophisticated corporations, however, (see our answer to question 2) the alternative to a potentially expensive and relatively ineffective retrofitting of engineering controls is to design new systems incor-

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porating the latest in automation and robotics, increasing productivity and efficiency while eliminating the exposure. Often the exposure is eliminated by eliminating humans almost entirely from the process.

The benefits accruing to automated processes include increased competitiveness in domestic and international markets, and favorable tax treatment for capital investment. The large hidden cost is to the workers who no longer have employment and who may not be able to learn new job skills.

7(b) WHAT ARE THESE COSTS ON A PER EMPLOYEE BASIS AND ON A PLANT WIDE BASIS?

Answer If the Task Force could supply some figures or examples here it would be helpful.

8. HAVE THERE BEEN INSTANCES WHERE THE INSTALLATION OF ENGINEERING CONTROLS FOR INDUSTRIAL HYGIENE PURPOSES HAS RESULTED IN LOWER OVERALL COSTS DUE TO ECONOMY OF RESOURCES, INCREASED PRODUCTIVITY, LESS EMPLOYEE TIME SPENT ON THE VARIOUS ASPECTS OF A RESPIRATOR PROGRAM, OR OTHER REASONS? IT YES, PLEASE DESCRIBE.

Answer We need Task Force input with examples here. See our response to Question 7.

9(a) IN WHAT SITUATIONS SHOULD ENGINEERING CONTROLS AND RESPIRATORS BE USED IN COMBINATION FOR THE REDUCTION OF EXPOSURE TO THE SAME HAZARD?

Answer See our response to Questions 1 and 2 as well as the following:

Respiratory protection used in combination with engineering controls should be considered in at least the following situations:

*Where installed engineering controls are not adequate to reduce employee exposure below safe levels or where the installation of such controls have resulted in an insignificant improvement in exposure reduction.

*Where installed engineering controls have proven to be unreliable and may occasionally fail, allowing employee exposure without warning.

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*Where, although engineering controls are installed, predictable exposures occur to extremely toxic materials (e.g., HF, HCN, BS) where such exposures may result in death or serious physical harm.

*Where the toxicity of the chemical is unknown, but considered extremely hazardous (i.e., lowest feasible concentration).

*Where absorption of toxicologically significant amounts through the skin can occur.

*Where very potent hazardous acute or chronic (carcinogens) with extremely low acceptable exposure levels are present and to ensure no over exposures, a combination of engineering controls and respiratory protection is necessary.

9(b) ON WHAT BASIS IS THE RELATIVE EMPHASIS BETWEEN THE TWO TO BE ARRIVED AT?

Answer See our response to Questions 1 and 2 as well as the following:

Primary considerations in selecting engineering controls vs. respirators are economic and technological feasibility (cost/practicability, can it be done, will it achieve the desired reduction?)

10. SHOULD OSHA ASSIGN A PREFERRED HIERARCHY TO DIFFERENT FORMS OF ENGINEERING CONTROLS SUCH AS: (i) MATERIAL SUBSTITUTION, (ii) PROCESS CHANGE, (iii) EQUIPMENT CHANGES, (iv) LOCAL EXHAUST VENTILATION, (v) GENERAL DILUTION VENTILATION, (vi) EQUIPMENT ENCLOSURES, AND (viii) EMPLOYEE ENCLOSURES?

Answer No. Where it is necessary to reduce employee exposure to toxic substances, the choice of the preferred form of control is highly dependent on the particular circumstances. These circumstances vary too much for a preferred hierarchy to be a generally useful guide. The best control method in one case may be the worst in another. Further, such a preferred hierarchy would tend to become technology limiting as new control methods are developed which are not included. Provided the control method will reduce exposures below established safe limits, and provided it is reliable, the employer should have the freedom to select the most cost effective method from among those available.

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10(a) IS THIS AN APPROPRIATE PRIORITY LIST?

No. No priority list is appropriate for a regulation for the reasons discussed above.

10(b) IS SOME OTHER PRIORITY LIST PREFERABLE?

No, same reasons.

11. IF OSHA ALLOWS EMPLOYERS TO CHOOSE COMPLIANCE STRATEGIES SHOULD OSHA ALSO REQUIRE EACH EMPLOYER WHO RELIES ON RESPIRATORS TO PREPARE A COMPLIANCE PLAN JUSTIFYING THE USE OF RESPIRATORS AND INCLUDING SUCH ITEMS AS: (i) EXPOSURE LEVEL OF EACH AFFECTED EMPLOYEE, (ii) REVIEW OF POSSIBLE CONSEQUENCES OF EXPOSURE, BOTH ACUTE AND CHRONIC, (iii) COMPLETE SCHEDULE OF FREQUENCY AND DURATION OF EXPOSURE, (iv) POTENTIAL FOR EMERGENCY EXPOSURE SITUATIONS, (v) ENGINEERING ANALYSIS OF LEAST EXPENSIVE FEASIBLE ENGINEERING CONTROLS, (vi) JUSTIFICATION FOR RELIANCE ON RESPIRATORS INSTEAD OF FEASIBLE ENGINEERING CONTROLS, (vii) ESTIMATED COSTS OF INSTALLING ENGINEERING CONTROLS, (viii) DESCRIPTION OF APPROPRIATE RESPIRATORY PROTECTION PROGRAMS, (ix) COSTS OF INSTITUTION OF RESPIRATORY PROTECTION PROGRAM, AND (x) COMPARISON OF ESTIMATED COSTS TO OTHER FINANCIAL DATA?

Answer A comprehensive analysis justifying the use of respirators is time consuming and unnecessary in many cases. Based on previous analyses and experience, use of respirators will be justified for work operations involving construction, repair, demolition or decontamination, infrequent jobs, short duration tasks, emergencies, etc. A compliance plan should not be required for these applications.

In other cases involving more than a few workers, frequent and/or long duration exposures and where a cost effective engineering control is available it is reasonable to require justification for use of respirators. The use of respirators in such situation would be justified at least in situations where respirators provide, reliable protection and (1) where installation of engineering controls would not significantly reduce the time that respirators need to be worn or (2) where engineering controls are significantly more costly (on a total cost basis, including initial capital investment, recurring expense, direct and indirect costs) than respirators.

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In such cases the employer could be required to show that he had determined the approximate cost of the least costly effective engineering control and compared it with cost of using respirators. If engineering controls are not significantly more costly than a respirator program, the use of engineering controls should be favored because of improved employee relations. A comprehensive compliance plan should not be required.

12. IN THOSE CASES WHERE RESPIRATORS HAVE NEVER BEEN RELIED ON AND ENGINEERING CONTROLS HAVE ALWAYS BEEN USED TO CONTROL TOXIC MATERIAL EXPOSURE,

12(a) WHAT PROPERTY OF THE TOXIC MATERIAL PRECLUDES THE USE OF RESPIRATORS?

Answer We know of no property of a toxic material that precludes use of a respirator.

12(b) IS THERE SOME SPECIFIC REASON RESPIRATORS ARE NOT USED?

Answer There is no specific reason why respirators could not be used. Those cases where respirators were never used usually involve new construction where engineering controls are most cost effective, (see our answer to question 7).

12(c) WHERE WERE THE ENGINEERING CONTROLS INSTALLED, WHAT WAS THE COST, AND WHAT PERCENTAGE IS THIS OF THE YEARLY CAPITAL BUDGET?

Answer If answered we will need data from Task Force members.

12(d) TO WHAT EXPOSURE LEVEL ARE THE ENGINEERING CONTROLS DESIGNED TO REDUCE AIRBORNE CONTAMINANTS?

Answer Generally where practical, engineering controls are designed to reduce airborne contaminants below PELs and further if it can be achieved at a reasonable cost.

13. IF OSHA REGULATIONS PERMITTED MORE EXTENSIVE RELIANCE ON RESPIRATORS:

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13(a) WOULD EXISTING ENGINEERING CONTROLS BE SHUT DOWN OR REMOVED? IF YES, EXPLAIN REASONS.

Answer This would not happen on any significant scale. Most of the cost of engineering controls is involved in their design and installation, not in their operation.

Conversely, much of the cost of a respirator program is involved with ongoing operation of the program. For economic reasons alone, it seems unlikely that engineering controls would be shut down or removed in favor of respirators.

13(b) WHAT ADDITIONAL BIOLOGICAL MONITORING OR MEDICAL TESTING, IF ANY, SHOULD BE INSTITUTED?

Answer No additional biological monitoring or medical testing would be necessary, solely as a result of more extensive reliance on respirators. This response is based on evidence that respirators are effective, when used correctly in a good respirator program. The need for

biological monitoring and medical testing depends on the material to which workers may be exposed, not on the abatement method used to prevent exposure. Where the contaminant is unusually toxic or can accumulate in the body, such tests may be indicated regardless of the control method.

13(c) WHAT TYPE OF RESPIRATOR WOULD BE USED?

Answer The type of respirator used would depend on the contaminants and the levels to which workers may be exposed. In a good respirator program, the choice would follow well-established guidelines, including the joint NIOSH/OSHA Respirator Decision Logic. Unless a good respirator program is in place, meeting criteria such as those in the ORC proposed respirator standard, the use of respirators should be prohibited.

13(d) WOULD OTHER ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT ALSO BE REQUIRED?

Answer In most cases no. It is conceivable that in some cases additional PPE such as eye protection or skin protection would be required. However, this would seldom occur because economics would tend to favor engineering controls where process leaks or other sources of contaminant would be so large as to require additional PPE.

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13(e) SHOULD SOME EXCEPTION BE MADE FOR THE PULMONARY DISEASED EMPLOYEE?

Answer

Yes. The great majority of workers can wear any type of respirator safely. However, a small minority of workers may have problems under certain conditions. For this reason all employee should be screened to determine if they can safely wear a respirator. The decision as to whether or not an employee can safely wear a respirator should be made by a physician after the individual with a problem is identified by a screening questionnaire as suggested by ORC. An evaluation by a physician is necessary for workers who will be assigned to use SCBA type equipment for emergencies or who will be involved in confined space entries. In evaluating the worker's physical condition, a complete history and physical examination should be required. See Appendix C of the ORC Recommended Revision of 1910.134 for suggestions for the content of medical examinations.

1 - 16. These questions involve the kind of information that must be supplied by the Task Force for specific situations if it chooses to answer these questions.

17. IN SOME INSTANCES FEASIBLE ENGINEERING CONTROLS SIGNIFICANTLY REDUCE THE LEVELS OF AIRBORNE TOXIC MATERIALS YET FAIL TO ACHIEVE FULL COMPLIANCE WITH APPLICABLE STANDARDS.

17(a) SHOULD SUCH ENGINEERING CONTROLS NEVERTHELESS BE REQUIRED?

Answer

No. The final decision as to whether the engineering controls are supplying sufficient protection to employees must be made by the competent professional at the scene. Situations vary too widely for any set of guidelines to have any relevance to them.

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17(b) WOULD SUCH CONTROLS REDUCE EMPLOYEE EXPOSURE EVEN WHERE RESPIRATORS ARE ALSO USED.

Answer

If the respirators that are being used are adequate to the task, and are being implemented as part of an integrated health and safety program, engineering controls would not increase the protection to the employee. There may be sound reasons for using many kinds of control methods in a given situation, but as stated previously, this can only be determined for each situation by the competent professional on the scene. See our response to Questions 1 through 3.