

Respiratory Protection

MSC-PRAC-30510

Revision 0

Effective Date: January 15, 2010

Topic: Safety and Health

Respiratory Protection

1.0 PURPOSE

This practice identifies a key aspect of the Mission Support Alliance (MSA) Safety & Health (S&H) industrial hygiene (IH) program, and establishes the requirements and practices for the purchase, issue, control, and use of respirators.

2.0 SCOPE

This practice includes the following elements:

- General Requirements
- Program Administration
- Medical Examination
- Training
- Fit Testing
- Exposure Assessment
- Assigned Protection Factors
- Selection of Respirators
- End of Service-Life Indicators for Cartridges
- Respirator Issue, Control, and Use
- Voluntary Use of Respirators
- Cleaning, Maintenance, and Storage
- Emergency/Immediately Dangerous to Life/Health (IDLH)
- Supplied Breathing Air Systems
- Annual Program Review/Evaluation

3.0 APPLICATION

This practice applies to MSA construction personnel.

4.0 GENERAL REQUIREMENTS

The requirements of this practice are consistent with the requirements published in the Hanford Mission Support Contract (MSC) Safety and Health virtual manual

Contractors and/or subcontractors who choose to adopt [MSC-PRO-120](#) for their own use must obtain approval through their contract then meet the requirements specified in this procedure.

This program establishes current OSHA Standards as the overall basis protection factors (PFs) for both radiological and chemical hazards.

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4.1 Records

4.1.1	Records generated during the performance of this activity are to be included in the Construction Work Package and will be managed in accordance with MSC-PRAC-30374 , <i>Construction Work Package</i> and MSC-PRAC-30376 , <i>Construction Document Control</i> .
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4.2 Respiratory Protection

4.2.1	Respiratory protection is used only in those instances when engineering or administrative controls are ineffective, impractical, or are in the process of being installed.
4.2.2	Based on a variance granted to the U.S. Department of Energy (DOE) by the Occupational Safety and Health Administration (OSHA), employees who wish to may wear contact lenses with respirators. Respirator wearers should practice with their contact lenses in place to see if there are any problems before wearing them with respirators in a hazardous atmosphere.
4.2.3	MSA uses the following sequence to prepare/qualify employees to wear respirators in hazardous atmospheres: <ul style="list-style-type: none"> • Medical examination for safety performance (refer to practice MSC-PRAC-30508, <i>Occupational Medical Program</i>), then • Training, then • Fit test
4.2.4	When a subcontractor's work involves respiratory protection, MSA will specify Respiratory Protection in Statement of Work. (Specifically Medical examination, Training and Fit Testing)
4.2.5	Respirators are National Institute for Occupational Safety and Health (NIOSH)-approved for the intended configuration and use.
4.2.6	Contractors whose Statement of Work allows off-site respirator medical qualification, fit test, training, and/or respiratory protection equipment must meet OSHA (29CFR1910.134) and applicable ANSI requirements. A written respiratory protection program addressing the OSHA and ANSI requirements must be submitted for review by the MSA respiratory protection program administrator (RPPA).

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4.3 Assigned Protection Factors

4.3.1	Differences in assigned protection factors (APF) for respirators exist between the various standards and guidelines. APFs can vary significantly for identical respirators. This is particularly true for radiological versus chemical exposures. It is important for either the Radiological Control Staff and/or Industrial Hygienists to carefully review the assigned PFs for the hazard and select the respirator accordingly.
4.3.2	When radiological and nonradiological hazards exist that require respiratory protection, the industrial hygienists and radiological control personnel will collaborate on selecting the appropriate respiratory protection against combined hazards. The basis for respirator selection and the selection of the type of respiratory equipment will be documented. Documentation of selected respirators can be done in work packages, job hazard analysis, radiation work permits or equivalent work instructions.
4.3.3	The MSA Respiratory Protection SME should be consulted if there are questions concerning assigned protection factors and maximum use concentration for respirators
4.3.4	The Maximum Use Concentration (MUC) is used to select air purifying respirators (APR) with the appropriate level of respiratory protection based on the assigned protection factor and the occupational exposure limit (OEL). The MUC is determined by the formula below: $\text{MUC} = \text{APF} * \text{OEL}$
4.3.5	MUCs are not used to select air purifying respiratory protection equipment for applications in conditions that are Immediately Dangerous to Life or Health (IDLH).
4.3.6	When the calculated MUC exceeds the IDLH level for a hazardous substance, or exceeds the performance limits of an air purifying cartridge or canister, then maximum allowed MUC will be set below the IDHL level.

4.4 End-of-Service-Life indicators for Cartridges

4.4.1	<p>Air purifying respirators are equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant, or if there is no ESLI appropriate for conditions in the workplace, a documented change schedule is specified for cartridges based on objective information or data that ensures cartridges are changed before the end of their service life, or a one-time use only method for cartridges is specified; this would be either after each use or only for 1 working shift.</p> <p>NOTE: Refer to OSHA, "<i>Respiratory Protection Advisor</i>," in determining the contaminant breakthrough for an activated carbon respirator cartridge using physical and environmental parameters specific to the contaminant and workplace.</p>
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4.5 Annual Program Review/Evaluation

4.5.1	<p>MSA RPPAs will conduct a comprehensive program review and evaluation at least annually. Resulting actions are tracked to completion on an appropriate system or using an appropriate method.</p> <p>NOTE 1: <i>MSA may choose to conduct a single program review/evaluation that includes all MSA projects, coordinated by the MSA S&H respirator program coordinator.</i></p> <p>NOTE 2: <i>Reviews/evaluations performed by others may be used in whole or in part in lieu of conducting the review/evaluation on any aspect of the program so long as the review/evaluation applies to the program as described in this practice.</i></p>
4.5.2	<p>At least every 3 years the program review/evaluation is conducted by a knowledgeable person not directly associated with the program(s).</p>

5.0 PROCESS

5.1 Program Administration

Actionee	Step	Action
Safety & Health Manager	1.	Designates a suitably trained person who serves as the respiratory protection subject matter expert (SME) and initial point-of-contact for program administration
SME & POC for S&H Manager	2. 3.	Oversees the implementation of practice requirements. Ensures a suitable medical provider is used to perform medical examinations.
		<p>NOTE: <i>MSA has designated the onsite occupational medical contractor (for self performed work) to perform medical examinations in accordance with its procedures that comply with OSHA and DOE standards.</i></p>
	4.	Designates the provider to perform fit tests.
		<p>NOTE: <i>MSA has designated HAMMER (for self-performed) to provide respirator fit testing in accordance with their procedures/lesson plans that meet the requirements of OSHA and DOE standards.</i></p>
	5.	Interfaces with MSA RPPAs on respirator program issues, processes, and events.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	6.	Coordinates with MSA project safety/hygiene on problem resolution (subcontractor RPPAs coordinate with MSA S&H).
	7.	Conducts annual evaluations of program effectiveness.

5.2 Medical Examination

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Supervisors/ Superintendents/ Managers	1.	Ensure that employees who will wear a respirator complete the required Respirator User Medical Questionnaire and complete or revise the employee's Employee Job Task Analysis to schedule the initial or annual respirator medical qualification examination. NOTE: <i>Subcontractors are not required to complete an Employee Job Task Analysis. MSA may request evidence of hazard determination for use of respiratory protection.</i>
	2.	Ensure that employees receive an initial medical examination prior to wearing a respirator.
	3.	Ensure that respirator wearers receive an annual medical examination to maintain their qualification to wear a respirator.
	4.	Ensure that the following information is forwarded to the medical provider in order to provide an accurate assessment of the employee's ability to wear a respirator: <ul style="list-style-type: none">• The type and weight of the respiratory equipment• The duration and frequency of the respirator use• The expected physical work effort• Additional protective clothing and equipment• Temperature and humidity extremes that may be encountered. NOTE: <i>Project respiratory protection "subject matter experts" assist management to obtain this information.</i>

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	5.	<p>Ensure that additional medical evaluations are provided if:</p> <ul style="list-style-type: none"> • The employee reports medical signs or symptoms related to the ability to use a respirator, or; • A change occurs in workplace conditions (such as physical work effort, protective clothing, and temperature) that may result in substantial physiological burden.

NOTE: *A medical clearance is acceptable for all types of respirators unless a specific medical limitation has been designated. Since the mask fit card indicates not only the tight-fitting respirators for which the employee has been properly fitted to wear, but also medically cleared to wear, only those employees with valid mask fit cards are issued a tight-fitting respirator. Workers wearing hoods do not get issued a mask fit card.*

5.3 Training

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
<p>Construction Supervisors/ Superintendents /Managers</p>	1.	<p>Enroll employees into initial respirator training course(s) as follows:</p> <ul style="list-style-type: none"> • Employees who may wear respirators • Employees who issue respirators • Employees who supervise respirator wearers <p>NOTE: <i>In general, only immediate supervisors (one-over-one) are required to be trained to the same level as any employee they supervise, and to maintain this training current.</i></p>
<p>MSA Training Coordinators</p>	2.	<p>Enroll employees into annual refresher training (assuming that the employee has a continued need to issue or wear a respirator or to supervise respirator wearers), or when changes in the workplace or respiratory equipment render previous training obsolete.</p>
	3.	<p>Ensure training is documented and records are maintained.</p>

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	4.	Subcontractors' shall make available, upon request documentation of training records for the worker, issuer, supervisor and any sub-tier contractor.

NOTE 1: *For radiation work, MSA will specify respirator training requirements or specific on-site training for the subcontractor.*

NOTE 2: *Subcontractors need to have available equivalency training documentation upon request by MSA.*

5.4 Fit Testing

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Supervisors/ Superintendents/ Managers	1.	Ensure that prior to the use of respirators in a hazardous atmosphere, respirator wearers receive a fit test annually for each make and model of respirator that will be used. If an employee needs to wear a respirator they have not been fit tested for, arrange for additional fit testing through the fit test station prior to use of the respirator.
	2.	Do not allow any worker to obtain a fit test who has facial hair that interferes with proper respirator fit. Ensure that respirator wearers shave the morning of the fit test and maintain facial hair in a manner that does not interfere with respirator fit.
		NOTE: <i>MSA has designated HAMMER to provide training for self performed in accordance with their procedures/lesson plans that meet the requirements of applicable OSHA and DOE standards.</i>
Respirator Wearers	3.	Notify their supervisor when physical changes occur that would warrant another fit test, such as the following: <ul style="list-style-type: none"> • A weight change of 20 pounds or more than 10 percent of total body weight. • Significant facial scarring in the area of the face piece seal. • Significant dental changes, such as multiple extractions without prosthesis or acquiring dentures. • Reconstructive or cosmetic surgery.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
		<ul style="list-style-type: none"> Any other condition that may interfere with face piece sealing or donning/doffing of respiratory equipment.

NOTE: *Fit testing for all tight fitting face piece respirators, regardless of whether they are used in the positive or negative pressure mode of operation, is conducted in the negative pressure mode.*

5.5 Exposure Assessment

NOTE: *The RadCon organization having jurisdiction performs this function for radiological contaminants.*

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Safety and Health	1.	Plans and implements an exposure assessment for the purpose of identifying and quantifying airborne contaminants to determine and validate the level of respiratory protection.
	2.	Qualitatively estimates and/or, as appropriate, quantitatively measures the airborne concentrations of chemical or particulate contaminants, before selecting a respiratory protection device.
	3.	Considers using qualitative hazard analyses, hazard surveys, historical data, objective data, or quantitative source/area/personal monitoring as the basis for selecting respiratory protection.
	4.	When respirators are specified for a contaminant that is regulated under a substance-specific OSHA standard (such as asbestos and lead), validates level of contaminant by initial and periodic personal/area monitoring, as required by the standard(s).
	5.	Documents hazards and specifies exposure monitoring to be conducted on job safety analyses (JSAs), work permits, work packages, or site-specific health and safety plans.

5.6 Selection of Respirators

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Supervisors/ Superintendents /Managers	1.	Ensure that the need for respiratory protection is evaluated in the work planning process, and that selected respiratory protection is specified in JSAs, work permits, work packages, or health and safety plans.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Safety and Health	2.	<p>Selects respiratory protection appropriate for chemical or other nonradiological hazards. Refer to the NIOSH Respirator Topic Page and/or OSHA “Respiratory Protection Advisor” for guidance on selection. The following are 2 important limitations on respirator selection:</p> <ul style="list-style-type: none">• Single use dust masks are only used for nuisance dusts below the threshold limit value (TLV).• Single use respirators are not used for purposes of protection against:<ul style="list-style-type: none">○ Nuisance dusts above the exposure limit (TLV)○ Toxic dusts at any level○ Mists, vapors, or gases at any level○ Asbestos fibers at any level○ As a substitute for the use of acceptable respiratory protection• Hooded, supplied-air respirators (“bubble suits”) are not acceptable for IDLH or oxygen deficient atmospheres.
	3.	<p>Collaborates with RadCon personnel to jointly select respiratory protection appropriate for the combination of hazards when both chemical and radiological hazards are present.</p>
	4.	<p>As appropriate, qualitatively estimates or quantitatively measures exposure during the planning, initial implementation, and conduct of jobs and tasks according to this program.</p>
	5.	<p>If the exposure assessment indicates the potential for exposure above the PEL/TLV, recommends implementation of engineering or administrative controls. If such controls are not feasible or if they may not be successful in lowering exposure to below the PEL/TLV, selects appropriate respiratory protection based on:</p> <ul style="list-style-type: none">• Characteristics of the hazardous agent.• Anticipated level of exposure relative to the PEL/TLV.• Relative stability of the exposure.• Possibility of a sudden release of the agent or engulfment.• Potential for an oxygen deficient or depleted atmosphere.• Warning properties of the agent.• Availability of monitoring to detect the agent in a timely fashion and take appropriate mitigating action.• Assigned protection factor of the respirator.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
		<ul style="list-style-type: none"> • Potential for an IDLH atmosphere (requires a specific plan; refer to Emergency/IDLH Use section of this practice).
	6.	Determines whether a substance-specific OSHA standard (such as lead and asbestos) designates particular types of respiratory protection. For substance-specific standards with prescriptive respiratory protection requirements, selects the designated level of respiratory protection as a minimum.
	7.	In selecting the type of respirator face piece, considers the need to protect the skin and eyes either with a full face piece or hooded respirator, or with alternate personal protective equipment. Also considers an individual's comfort, stress, visibility, and safety factors.
	8.	Specifies the selected respiratory protection and change-out schedule on the appropriate document that controls the work.

5.7 Respirator Issue, Control, and Use

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Managers	1.	(MSA only) Coordinate with client(s) to provide respiratory protection equipment for MSA activities.
	2.	Establish secured, controlled distribution point(s) for the proper storage, issue, and return of respiratory protection equipment for the project.
	3.	Designate project respirator issuer(s) to control the custody and integrity of respirators.
	4.	Ensure the respirator issuer(s) maintains current training for(MSA only): <ul style="list-style-type: none"> • Each type of respiratory protection equipment they issue/store on the project (Course #020103) • Self-reading of practices MSC-PRAC-30510 and (if applicable) MSC-PRAC-30515, Supplied Breathing Air Systems.
	5.	Ensure that the respirator issuer(s) is informed of the types and quantities of respiratory protection equipment required for the project.
	6.	In special circumstances where modified issue and control measures are required to accommodate unusual situations, develop and document alternate plans for issue and control.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>	
Construction Supervisors/ Superintendents	7.	Ensure that respirator issuers have access to JSAs, work permits, work packages, and site-specific health and safety plans that document respirator selection.	
	8.	Ensure issuers make access to documentation to verify medical qualification, training and fit testing.	
	9.	Ensure that respirator wearers have current medical clearance, training, and fit testing appropriate for the makes and models of respirators to be issued for the project.	
	10.	Notify the respirator issuer of the types of respirators selected for use on the project, access to JSAs, work permits, work packages, and site-specific health and safety plans that document respirator selection.	
	11.	Periodically inspect work areas to ensure that proper respiratory protection equipment is issued and worn as designated.	
	12.	Retrieve issued respirators that have not been returned, not properly maintained, or stashed.	
	Safety and Health	13.	Provide information to Purchasing for obtaining or replacement orders for respirators and cartridges as needed for specific activities
		14.	Provides technical support to the respirator issuer.
		15.	Assists the construction manager/client(s) in providing respiratory protection equipment for MSA activities.
		16.	Periodically documents oversight inspections to ensure that proper respiratory protection equipment is issued and worn as designated on work control documents.
		17.	Provides constant oversight of subcontractor work activities and respirator control.
	Respirator Issuer	18.	Maintains control of respirators at the facility/project from time of receipt through return.
19.		Tracks respirator receipt, issue, and return on form (A-6004-418).	

NOTE: Forms ([A-6004-418](#)) are OOU when filled out.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	20.	(MSA only) Interfaces with facilities as necessary/appropriate to maintain appropriate levels of stock in the distribution area.
	21.	Prior to issuing respirators, verifies that the wearer is qualified to wear a respirator through ACES station database, training records, original training provider or the occupational medicine provider.
		NOTE: <i>Copies of mask fit cards may be kept at the issuing station(s), but must be maintained current.</i>
	22.	Issues respirators, as selected by safety and health and RadCon personnel and designated on applicable work planning document(s), to authorized wearers.
	23.	Establishes the time cycle for return of respirators by wearers. If daily return is impractical, establishes alternate return cycles and informs wearer of the need to properly clean and store respirators.
	24.	Ensures used respirators are picked up by, or returned to, the facility for cleaning and servicing.
	25.	Notifies the project safety/hygiene SME of any respiratory protection issues (such as damaged, inadequately cleaned, or other unacceptable respirator conditions, events, and problems). Notification to the RPPA is accomplished by submitting a completed Respirator Problem or Complaint (Site Form A-6001-893).
	26.	Periodically verifies inventory and integrity of stored respirators to assure respirators are protected from physical and chemical agents such as sunlight, heat, cold, excessive moisture, and distortion to the face piece or elastomeric parts.
	27.	Notifies supervision when respirators are not returned as specified.
	28.	Orders and restocks project respiratory equipment as needed to have sufficient inventory available to support project work. Order only respiratory equipment on the RPPA approved list.
	29.	Contact radiation control personnel to determine facility survey practices when respirators are to be used in radiological contaminated area.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Respirator Wearers	30.	Satisfy requirements to wear a respirator by maintaining current (within the past calendar year) medical clearance, training, and fit testing (in this order).
	31.	Obtain respirators from the respirator issuer.
	32.	Inspect each respirator prior to use to ensure that it is in proper working condition.
	33.	Conduct a positive and negative fit check each time an air purifying respirator (APR) is put on or adjusted.
	34.	Maintain facial hair in a manner that does not interfere with the respirator face piece sealing surface.
	35.	Properly use and care for respirators issued.
	36.	Leave the respirator use area immediately if breakthrough of vapor or gas is detected, a change in breathing resistance is detected, or leakage of the face piece occurs.
	37.	Return respirators to the return receptacle at the project respirator distribution point according to time/use criteria established in work control documents for cartridges and as directed by the respirator issuer.
	38.	Promptly report any skin irritation that may be caused by respirator use to the supervisor and project safety/hygiene or radiation protection SME.
39.	Promptly report and notify the respirator issuer and supervisor of any damaged, inadequately cleaned, or otherwise unacceptable respirator conditions and assist the issuer in completing the Respirator Problem or Complaint Form (Site Form A-6001-893).	

5.8 Voluntary Use of Respirators

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Safety and Health & Supervision	1.	Refer to OSHA 29 CFR 1910.134(c)(2)(i) and (ii) for those employees who want to voluntarily wear a respirator when the use is not required. Compliance with Appendix D of the above OSHA standard and all aspects of this practice (and if applicable, practice MSC-PRAC-30515) are mandatory.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Line Management	2.	May provide respirators at the request of employees, but may not permit employees to use their own respirators, if line management determines such respirator use will not in itself create a hazard.

5.9 Cleaning, Maintenance, and Storage

Respirator users are provided respirators that are clean, sanitary, and in good working order. Cleaning, disinfection, and maintenance of respirators are conducted according to a procedure developed and documented in accordance with requirements of current OSHA standards.

NOTE 1: *MSA has designated the provider under contract to its clients via DOE-RL to perform cleaning, sanitizing, and maintenance of respirator face pieces.*

NOTE 2: *The Hanford Fire Department provides maintenance of air supply bottle carts and self-contained breathing apparatus for MSA.*

- *Subcontractors using subcontractor provided equipment will ensure the maintenance of air-supplied systems comply with the manufacturer’s instructions and recommendations.*

NOTE 3: *A procedure is developed and documented for cleaning/sanitizing air supply respirator regulators.*

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Supervisors/ Superintendents /Issuers	3.	Develop alternate plans (approved by the project RPPA) to ensure the proper cleaning, maintenance, and care of respirators In unusual circumstances where respirators must be cleaned and stored in the field or within a facility other than the issuing station.
Project Management	4.	<p>Designate controlled distribution area(s) for respirators and associated respiratory protection equipment.</p> <ul style="list-style-type: none"> • Equipment is stored in a manner that protects it against physical and chemical agents such as sunlight, heat, cold, excessive moisture, or damaging chemicals. • Equipment is stored in a manner to prevent distortion of the face piece or elastomeric parts.
Respirator Wearers	5.	If a respirator requires maintenance other than normal cleaning, return it and inform the issuer about the maintenance required.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	6.	When respirators are used in contaminated areas, a radiological release survey is required. To determine facility survey practice, contact RadCon personnel.
	7.	Do not leave respirators lying on shelves, table tops, inside vehicles, or hanging on protrusions from equipment or walls.

5.10 Emergency/IDLH Use

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Managers and Safety and Health (to include the SME)	1.	Develop Pre-Job Safety Plan (documented/approved in accordance with practice MSC-PRAC-30462 , <i>Prejob Safety Planning</i> for entry into an IDLH atmosphere. The Hanford Fire Department is included in the preparation and approval of such plans.
Hanford Fire Department	2.	The only designated responder for emergency conditions and entry into IDLH conditions.

5.11 Supplied Breathing Air Systems

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Construction Supervisors/ Superintendent/ Managers	1.	Perform supplied breathing air system design, installation, and use in accordance with practice MSC-PRAC-30515 .

6.0 FORMS

Respirator Problem or Complaint, ([A-6001-893](#))
Respiratory Protection Equipment Issuance Log ([A-6004-418](#))

7.0 RECORDS IDENTIFICATION

Records Capture Table

Name of Document	Submittal Responsibility	Retention Responsibility
<i>Respirator Problem or Complaint</i> , (A-6001-893)	Construction Supervisor/Superintendent	Project Document Control
Respiratory Protection Equipment Issuance Log (A-6004-418)	Construction Supervisor/Superintendent	Project Document Control

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8.0 REFERENCES

[MSC-PRAC-30374](#), *Construction Work Package*
[MSC-PRAC-30376](#), *Construction Document Control*
[MSC-PRAC-30462](#), *Prejob Safety Planning*
[MSC-PRAC-30508](#), *Occupational Medical Program*
[MSC-PRAC-30515](#), *Supplied Breathing Air Systems*
[MSC-PRO-120](#), *Respiratory Protection Program*

American National Standards Institute (ANSI Requirements Specific to Respiratory Protection)

National Institute of Occupational Safety and Health
NIOSH: [Respirator Topic Page](#)

Occupational Safety and Health Administration
OSHA, [Respiratory Protection Advisor](#)

9.0 APPENDICES

[Appendix A](#), Assigned Protection Factors

Respiratory Protection

Appendix A

Table 1, -- Assigned Protection Factors
29 CFR 1910.134, Subpart I Table 1

Type of Respirator ^{1,2}	Quarter Mask	Half mask	Full face-piece	Helmet/hood	Loose-fitting face piece
1. Air Purifying Respirator.	5	³ 10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR).	50	1,000	⁴ 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator.
• Demand mode.	10	50	.....	.....
• Continuous flow mode	50	1,000	.....	25
• Pressure-demand or other positive-pressure mode.	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA).
• Demand mode.	10	50	50	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit).	10,000	10,000	.....

NOTES:

¹ Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

² The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

³ This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

⁴ The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a QPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting face-piece respirators, and receive an APF of 25.

⁵ These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910.134, subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134, (d)(2)(ii).