

Glenn Research Center, Environmental Program Manual

Chapter 12 – RESPIRATORY PROTECTION PROGRAM

NOTE: The current version of this Chapter is maintained and approved by the Environmental Management Office (EMO). The last revision date of this chapter is May 2004. If you are referencing paper copies, please verify that it is the most current version before use. The current version is maintained on the Glenn Research Center intranet at <http://osat-ext.grc.nasa.gov/emo/pub/epm/epm-contents.pdf>. Approved by: EMO Chief, Michael Blotzer {[mailto: Michael.J.Blotzer@grc.nasa.gov](mailto:Michael.J.Blotzer@grc.nasa.gov)}.

PURPOSE

This chapter establishes minimum requirements for the NASA Glenn Research Center's Lewis Field (GRC) and Plum Brook Station Respiratory Protection Program. It is intended to ensure employee protection from hazardous airborne materials through the implementation of engineering, work practice, and administrative controls to minimize employee exposure. When these controls do not effectively reduce employee exposures to safe levels, they will be used in conjunction with respiratory protection.

APPLICABILITY

The Respiratory Protection Program is applicable to all personnel (civil servants and contractors) who use respirators for protection of health or who may, on an emergency response basis, need to use respirators at the GRC and Plum Brook Station. The Respiratory Protection Program procedures described in this chapter will be followed except where substance-specific OSHA regulations contain more stringent or additional requirements.

DEFINITIONS

Air-Purifying Respirator

A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element. Assigned protection factor (APF) [Reserved]. This definition will be updated in a subsequent phase of OSHA's rulemaking.

Annual

Referring to a 12 month cycle

Atmosphere-Supplying Respirator

A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SAR's) and self-contained breathing apparatus (SCBA) units.

Competent Person

A person within the Industrial Hygiene Team who has demonstrated the knowledge and skills necessary to administer certain GRC Respiratory Protection Program procedures such as fit testing, training, hazard assessments, etc.

Demand Respirator

An atmosphere-supplying respirator that admits breathing air to the face piece only when a negative pressure is created inside the face piece by inhalation.

Dusts

Solid particles mechanically generated by handling, crushing, grinding, sawing, rapid impact or detonation of organic or inorganic materials such as metal, coal, wood, and dirt.

Canister or Cartridge

A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Emergency Situation

Means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee Exposure

Means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-Of-Service-Life Indicator (ESLI)

Means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Engineering Controls

Are methods of controlling employee exposures to toxic materials by modifying the source or reducing the quantity of contaminants released into the workroom environment.

Escape-Only Respirator

A respirator intended to be used only for emergency exit.

Filter Or Air Purifying Element

A component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering Face Piece (Dust Mask)

A negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium.

Fit Factor

A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit Test

Means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

Fumes

Airborne particulates formed by the evaporation of solid materials, e.g., metal fume emitted during welding. Usually less than 0.1 μ m in diameter.

Hazard Assessments

Industrial hygiene evaluation of the health hazards posed by a specific operation or task.

Helmet

A rigid respiratory inlet covering that also provides head protection against impact and penetration.

High Efficiency Particulate Air (HEPA) Filter

Means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 μ m in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood

A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately Dangerous To Life Or Health (IDLH)

Means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Interior Structural Firefighting

Means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures that are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)

Loose-Fitting Face Piece

A respiratory inlet covering that is designed to form a partial seal with the face.

Maximum Use Concentration (MUC)

This definition will be updated in a subsequent phase of OSHA's rulemaking.

Mists

Suspended liquid droplets generated by condensation or by breaking up of a liquid into a dispersed state, such as by splashing, foaming or atomizing. Mist is formed when finely divided liquid is suspended in air.

Negative Pressure Respirator (Tight Fitting)

A respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Nuisance Dust

A generally innocuous dust, not recognized as the direct cause of a serious pathological condition.

Oxygen Deficient Atmosphere

Atmosphere with oxygen content below 19.5% by volume.

Permissible Exposure Limit (PEL)

The airborne concentration of a substance that, even on repeated daily exposure, will pose no adverse health effects to nearly all workers. PEL's are published and enforced by the Occupational Safety and Health Administration as a legal standard.

Physician Or Other Licensed Health Care Professional (PLHCP)

Is an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by the Respiratory Protection Standard.

Positive Pressure Respirator

A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered Air-Purifying Respirator (PAPR)

Air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure Demand Respirator

A positive pressure atmosphere-supplying respirator that admits breathing air to the face piece when the positive pressure is reduced inside the face piece by inhalation.

Qualitative Fit Test (QLFT)

A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent. QLFT provides only a pass/fail result.

Quantitative Fit Test (QNFT)

An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory Inlet Covering

A portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a face piece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-Contained Breathing Apparatus (SCBA)

An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service Life

Is the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

Supplied-Air Respirator (SAR) or Airline Respirator

An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

Threshold Limit Value (TLV)

The airborne concentration of a substance to which nearly all workers may be repeatedly exposed without adverse health effects. TLV's are guidelines used in the practice of industrial hygiene. TLV's are published by the American Conference of Governmental Industrial Hygienists and are not legal standards.

Tight-Fitting Face Piece

A respiratory inlet covering that forms a complete seal with the face.

User Seal Check

An action conducted by the respirator user to determine if the respirator is properly seated to the face.

Vapors

A gaseous form of a substance that is normally in the solid or liquid state at standard temperature and pressure.

POLICY

The Glenn Research Center (GRC), as part of its effort to provide a safe and healthful work environment, is committed to protect all employees from exposure to harmful concentrations of hazardous or toxic dust, fumes, mists, vapors, gases, or oxygen-deficient atmospheres. Where effective engineering controls are not feasible or while they are being instituted, respiratory protection measures described herein shall be used to protect workers. The Respiratory Protection Program encompasses all aspects of respiratory protection, from the initial hazard assessment, where the need for a respirator is determined, to the program evaluation, where the effectiveness of the program is assessed. The flow chart [Appendix A](#) provides an outline of the Respiratory Protection Program.

RESPONSIBILITIES

Industrial Hygiene Team (IHT)

- Develops and implements a Respiratory Protection Program that complies with the requirements of all applicable federal, state and local governments
- Performs hazard assessments
- Provides initial and refresher Respiratory Protection Training to employees who will be or are using respiratory protection
- Provides guidance on the selection, use, and fitting of respiratory protection.
- Conducts Respiratory Protection Training specific for supervisors
- Maintains training records of employees that have received training on respiratory protection
- Conducts hazard assessments to determine where respiratory hazards are present
- Selects appropriate respiratory protection that is approved by NIOSH for each hazard, based on workplace factors
- Conducts annual fit tests.
- Confirms demonstration of proper use of respiratory protection (donning, removing, and cleaning).
- Maintains fit test records
- Provides information on the specific use of the respirator to the Physician or Other Licensed Health Care Professional (PLHCP)
- Develops cartridge change-out schedules for respirators used to protect against gases and vapors
- Maintains air compressor and components for compressed air cylinders.
- Performs periodic program evaluation to ensure continued effectiveness.

Medical Services

- Administers medical questionnaire and conducts spirometry test annually.
- Provides a written opinion regarding the employee's physical ability to use a respirator, any limitations of use, and the need for any follow-up evaluations to the IHT.
- Maintains records of medical evaluations.

Plum Brook Management Office (PBMO)

- Administers this Respiratory Protection Program for Plum Brook Station.

Supervisors

- Contact the IHT to perform a hazard assessment of a task that may pose an inhalation concern
- Assist the IHT in identifying needed hazard evaluations.
- Know the hazards or tasks in their areas that require respiratory protection
- Know the types of respirators that need to be used
- Enforce the requirements of the Respiratory Protection Program in their area
- Ensure that employees are knowledgeable about the respirator requirements for the areas in which they work and the tasks they perform
- Attend Respiratory Protection Program training for supervisors.

Employees

- Comply with all aspects of the program including but not limited to annual respirator fit testing, annual respirator training, and annual medical spirometry tests.
- Comply with the proper procedures for using, cleaning, maintaining, and storing the respirator
- Support the IHT in conducting a hazard assessment for a task that may pose an inhalation concern.
- Notify the IHT when using the respirator for materials other than those in the most recent hazard assessment.
- Wear the respirator that they were fit tested with
- Wear the recommended filter, cartridge or canister for the hazard they will be exposed to
- Prohibit other employees from wearing their respirator.
- Perform a user seal check before entering into a hazardous environment.
- Ensure a clean shaven face around the respirator's sealing surface.
- Contact the IHT to schedule an exposure assessment

Contractors

- Provide, manage, and implement their own respiratory protection programs. Contractor respiratory protection programs shall comply with all Occupational Safety and Health Administration (OSHA) regulations as well as with the GRC program.

Contracting Officer Technical Representatives (COTRs)

- Become knowledgeable with program requirements and ensure contractor's comply with the requirements.
- Forward compliance concerns onto Contractor's Project Manager and ensure compliance concerns are addressed.

Students

- Co-op students are employees of GRC and are included in the GRC Respiratory Protection Program
- Student interns are employees of their respective universities and thus would not be covered by the GRC Respiratory Protection Program; however, since the student is working in the confines of GRC, the IHT can assist by conducting a hazard assessment of the operation.

REQUIREMENTS

Hazard Assessment

A hazard assessment must be performed to determine if respiratory protection is needed. During the hazard assessment, several factors will be investigated including:

- The nature of the task being performed and the potential for generation of airborne contaminants
- The physical, chemical, and toxic properties of the material
- The concentration and duration of exposure
- The frequency of exposure
- The environmental factors (heat and humidity)
- Worker exertion level while performing the task
- Other protective equipment needed
- The potential for engineering and administrative controls

This information will be used to determine a reasonable estimate of exposure based on professional judgment. Where a reasonable estimation of employee exposure cannot be determined, the atmosphere must be considered immediately dangerous to life or health (IDLH).

If an inhalation hazard is identified based on information from the hazard assessment, the IHT will recommend the installation of controls. Engineering and administrative controls such as ventilation, chemical substitution, and limiting or restricting personnel access to areas will be used whenever feasible and practical. When engineering controls are not feasible and practical, or do not completely eliminate the hazard, respiratory protection will be used. Respiratory protection will be used until engineering controls or administrative procedures can be implemented and tested for effectiveness. For tasks that are of short duration, infrequent or non-routine, respiratory protection can be used.

When it has been determined that an employee must wear respiratory protection, the Industrial Hygienist will keep a database on hazard assessment information, fit test information, and exposure assessment information.

If there is more than one employee in an area performing the same task requiring respiratory protection, one hazard assessment can be performed for all employees performing that task.

If the user intends to use the respirators in unknown atmospheres or in the presence of hazardous materials other than those in the hazard assessment, the user shall request a new hazard assessment.

Selection of Respirators

Respiratory Protection will be selected based on information obtained during the hazard assessment and the assigned protection factors for the respirator. Proper selection of respirators shall be made according to 29 CFR 1910.134 and with the guidance of the American National Standards Institute (ANSI) "Practices for Respiratory Protection" Z88.2. OSHA's assigned protection factors will replace the NIOSH recommended protection factors after the data is reviewed and published in 29 CFR 1910.134.

All respirators shall be approved and certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR Part 84. Air-purifying respirators shall not be used in oxygen deficient atmospheres, IDLH atmospheres or unknown atmospheres. Full-face piece respirators shall be used when there is potential for flying particles, liquid chemical splashes or a corrosive atmosphere.

If the PLHCP determines that an employee's health is at increased risk if a negative pressure respirator is used, the employee will be provided a PAPR if the PLHCP determines that such a respirator can safely be used. Employees may choose to use a Powered Air Purifying Respirator (PAPR) in lieu of a negative pressure respirator ; however, purchase and use of a PAPR is subject to the approval of the IHT.

Disposable filtering facepieces may be used for nuisance particulate levels. Use of disposable respirators does not require a medical spirometry test or fit test but does require training and compliance with all other aspects of the Respiratory Protection Program, the written approval of an industrial hygienist, and the information provided in [Appendix B](#).

Medical Surveillance

Using a respirator places a physiological burden on the respirator user. The degree of the physiological burden varies with the type of respirator being worn, the task, work environment, and the medical status of the employee. A medical evaluation will be performed to determine the employee's ability to use a respirator. The medical evaluation must be completed before the employee is fit tested or required to use the respirator in the workplace.

Before the PHCLP makes a recommendation on the employee's ability to use a respirator, the Industrial Hygiene Team must provide information on the type and weight of the respirator to be used, the duration and frequency of use, the expected physical work load, additional protective clothing worn, and temperature and humidity extremes that may be encountered.

The employee's medical status shall be reviewed annually by a PHLCP. If an employee is unable to stay up-to-date in the medical surveillance program, that employee is no longer permitted to wear the respirator and therefore is no longer able to perform the tasks requiring respiratory protection. The IHT has the authority to retrieve respirators from employees out of compliance with the program.

Only persons found to be physically able shall be assigned a task requiring the use of a respirator. The Physician or Other Licensed Health Care Professional (PLHCP) shall conduct a medical questionnaire that meets the requirements of 29 CFR 1910.134 and a spirometry test. The PLHCP may also include any other health and physical conditions that are pertinent, and shall perform a pre-placement medical examination. The PLHCP shall prepare a written opinion regarding the employee's physical ability to use a respirator, any limitations of use and the need for any follow-up evaluations. A copy of the written opinion shall be sent to the IHT for inclusion in the Respiratory Protection Program files.

The employee's medical status shall also be reviewed whenever the employee experiences medical signs or symptoms that are related to the ability to use the respirator or information including observation during fit testing or program evaluation indicates a need for a re-evaluation.

Records of medical evaluations will be maintained and made available in accordance with 29 CFR 1910.1020.

Training

The IHT shall provide training for each employee who is required to wear a respirator. Training shall be conducted by an industrial hygienist prior to use and annually thereafter. If an employee is unable to stay up-to-date in the training program, that employee is no longer permitted to wear the respirator and therefore is no longer able to perform the tasks requiring respiratory protection. The IHT has the authority to retrieve respirators from employees out of compliance with the program.

Employees who are required to use a respirator will be trained on the following topics before they use the respirator. Annual refresher training will occur every year after that.

- Why the respirator is necessary and how the improper fit, usage, or maintenance can compromise the protective effect of the respirator
- When to wear the respirator
- What the limitations and capabilities of the respirator are
- How to use the respirator effectively in emergencies including situation in which the respirator malfunctions
- How to inspect, put on, remove and use the respirator
- How to clean the respirator (including a hands on cleaning session)
- How to maintain and store the respirator
- How to fit the respirator and perform the user seal check
- How to recognize medical signs and symptoms that may limit or prevent the effective use of a respirator

Refresher training will be conducted annually but also more frequently if:

- A change in the workplace occurs
- A change in the type of respirator occurs
- An employee demonstrates a need for refresher training

Fit Testing

Employees required to wear tight-fitting air-purifying respirators (that is, respirators dependent on a facepiece-to-face seal) and tight-fitting atmosphere-supplying respirators shall be fit tested to ensure that the respirator selected fits the employee well enough to provide the adequate protection. The employee shall be fitted with a respirator from a selection that includes at least three sizes of each type of face piece from at least two different manufacturers. An industrial hygienist shall choose the appropriate respirator.

The IHT will perform quantitative fit testing on all tight fitting respirators. For tight-fitting atmosphere-supplying respirators, the facepiece shall be tested as a negative pressure respirator, without the air-supplying equipment or attachments. If the respirator facepiece passes the test, the assigned protection factor shall be in accordance with those established by OSHA.

The employee shall be fit tested after the initial medical surveillance but prior to the first use of the respirator and annually thereafter. If an employee is unable to stay up-to-date with fit tests, that employee is no longer permitted to wear the respirator and therefore is no longer able to perform the tasks requiring respiratory protection. The IHT has the authority to retrieve respirators from employees out of compliance with the program.

The IHT will keep a database of fit testing information.

USE OF RESPIRATORS

Respirator users are categorized as Active or Inactive and Voluntary or Required users. Active respirator users are those employees who are presently using a respirator. Inactive respirator users are those employees who no longer use their respirator and those who are no longer employed by GRC. Required users are employees whose hazard assessment identified a potential for high contaminant concentration which needs to be quantified by sampling or employees whose exposure assessment has determined that respiratory protection is required. Voluntary users are employees whose hazard assessment or exposure assessment has identified that contaminant concentrations are not high enough to pose an inhalation hazard.

Respirators may not be worn under conditions that would interfere with the face piece-to-face seal or good fit. Examples of such conditions include facial hair, facial scars, eyeglasses with sidebars, and headgear that interferes with the seal. Any facial hair that interferes with the facepiece-to-face seal or the operation of the inhalation or exhalation valves must be completely shaved for tasks requiring respirator use. If glasses must be worn, they must not interfere with the seal of the facepiece. A respirator spectacle kit will be issued when a full-facepiece respirator is required.

Air purifying respirators can only be worn in environments with safe oxygen levels, known contaminants, and for contaminants that have low toxicity and good warning properties. The half-mask air-purifying respirator may only be used in atmospheres that do not exceed 10 times the established permissible exposure limit. The full-facepiece air-purifying respirators may only be used in atmospheres that do not exceed 50 times the established permissible exposure limit.

For air purifying respirators used to protect against gases and vapors, the IHT will develop a cartridge change out schedule based on information obtained from the hazard assessment, exposure assessment, and cartridge manufacturer. This change out schedule will determine when the cartridge must be replaced. The employee is responsible for keeping a log on the duration a chemical cartridge has been used so it can be replaced on schedule. For air purifying respirators used to protect against fumes and particulates, the filters will be changed out when the breathing resistance becomes uncomfortable.

Only full-facepiece pressure-demand supplied-air respirators (SAR) with an auxiliary self-contained air supply or self-contained breathing apparatus (SCBA) may be used in an unknown, oxygen deficient, or IDLH atmosphere. Each SCBA cylinder used in IDLH atmospheres or for emergency entry or fire fighting shall be certified for a minimum service life of 30 minutes.

Before entering the work area, employees shall perform a user seal check for all tight fitting facepieces. A user seal check is performed every time a tight fitting respirator is worn to ensure a proper seal is being made. To perform a user seal check, the respirator must be challenged under positive and negative pressure. A positive pressure test is

performed by closing off the exhalation valve and exhaling gently into the face piece. If a slight positive pressure is built up in the face piece then the fit is satisfactory. A negative pressure check is performed by closing off the inlet openings with the palm of the hands and inhaling gently so the facepiece collapses slightly. Emergency use of respirators required for GRC employees shall first require the approval of the IHT. All emergency use respirators shall be administered and controlled by the IHT. See the section on "Emergency Use of Respirators".

Voluntary Use of Respirators

Voluntary use of tight-fitting respirators requires that employees receive their annual training, medical examination and fit testing. Voluntary users are identified as those individuals who choose to wear a respirator when their tasks have been identified as not creating a health concern either during the hazard assessment or exposure assessment.

Voluntary use of a filtering facepiece (dust mask) does not require inclusion in the Respiratory Protection Program; it does however, require that the employee receive and understand the information in [Appendix B](#). The form must be reviewed and signed by the employee and their Branch Chief (or COTR for contractors) and returned to the IHT.

Maintenance of Respirators

Respirators shall be inspected before each use and during cleaning. Inspections shall include respirator function, tightness of connections, and the condition of the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters and the pliability of rubber/silicone parts for signs of deterioration. If any part of the respirator is found to be deteriorated, the respirator shall be discarded.

Workers are responsible for the maintenance of their personal respirators. Respirators shall be cleaned and disinfected after each use. If the respirator is used periodically throughout the day it should be cleaned at the end of the day. The respirator shall be cleaned according to the recommendations provided by the manufacturer or by using the following procedures:

For heavy contamination:

- Disassemble respirator completely
- Wash in warm water with mild detergent
- Rinse all components in clean, warm water
- Allow components to air dry or hand dry with a lint free cloth
- Re-assemble facepiece

For minor contamination

- Clean the sealing surface, straps and outside of the respirator with a non alcohol towelette

Respirators shall be stored in a sealed plastic bag after they have dried completely. They must be stored in a manner that protects them from damage, dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals. They shall be stored to prevent deformation of the face piece or the exhalation valve. Respirators for emergency use must be clearly marked and stored where they are always accessible.

Replacement of respirator filters or cartridges shall be in accordance with a schedule established by an industrial hygienist. Replacement filters or cartridges shall be obtained from Stores Stock. If the necessary cartridges are not available from stock they may be purchased from an outside vendor.

Assuring Continued Respiratory Protection

Employees must leave the hazardous area when:

- They wash their faces and/or respirator facepieces to prevent eye or skin irritation
- They detect vapor, particulate or gas breakthrough
- Changes in breathing resistance occur
- A leak in the facepiece is detected
- They need to replace the respirator, filter, cartridge or canister elements

The above conditions will be remedied by repairing or replacing the respirator before the employee returns to the area.

Respirator Use in Immediately Dangerous to Life or Health Atmospheres

Emergency-use respirators shall be inspected and tagged at least monthly as well as being inspected before and after each use. This inspection is to be performed by the individual who wears the respirator. The SCBA inspection must be documented including the date of inspection, person doing inspection, required remedial action, and identification number for the SCBA. The documentation must be on a tag or label attached to the storage compartment for the SCBA.

When emergency use of respiratory protection is required, call 911 Glenn Dispatcher. Examples of such situations include unknown atmospheres, rescue of workers from a confined space, oxygen deficient atmospheres, IDLH atmospheres, or a situation where an employee may be overcome by toxic vapors.

SAR's and SCBA's shall only be used by personnel trained in their use and limitations. Users of SCBA will receive training specific to their SCBA equipment on an annual basis.

The buddy system shall be used where at least one standby person shall be present in a safe area and equipped with the same level of protection as the employee in the IDLH area. Communication (visual, voice, or signal) shall be maintained at all times between the standby person and the individual in the IDLH atmosphere. The employee outside of the IDLH atmosphere must be trained and equipped to provide effective emergency rescue.

Respirator wearers in IDLH atmospheres shall be equipped with retrieval equipment for lifting or removing them from the area or equivalent provisions for rescue shall be in place.

Breathing Air Quality and Use

Breathing air used for respiration shall be of high quality purity. At a minimum, it must meet the specifications for Type 1- Grade D breathing air as described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989.

Cylinders of breathing air must be tested and maintained as prescribed in 49 CFR Part 173 and 178. They must come with a certificate of analysis from the supplier that the breathing air meets the requirements for Type 1- Grade D breathing air.

Compressors used to supply breathing air must be constructed and situated as to prevent entry of contaminated air in the air-supply stream and minimize moisture content. They must be equipped with suitable in-line sorbent beds and filters and an in-line carbon monoxide monitor. The filters and sorbent beds must be tagged with information including the most recent change date and a signature of the person who performed the change.

PROGRAM EVALUATION

The Respiratory Protection Program will be reevaluated every year to ensure the program is effective and in compliance with all applicable regulations. This evaluation will be conducted by:

- Consulting with employees to ensure they are using and maintaining their respirators properly
- Consulting with employees to ensure they are able to wear their respirator without having it hinder their jobs
- Consulting with employees to determine how effective they feel the program is
- Determining whether or not there have been changes in the workplace that should be included in this program
- Consulting with OSHA standards to ensure new changes have not taken place in 29 CFR 1910.134.

COMPLIANCE

The following procedures will be used to ensure compliance with OSHA requirements.

Fit Tests, Training and Medical Evaluations

The IHT will send out notices on a monthly basis to employees who are due that month for their annual fit test.

When employees fail to meet the annual requirements, the following procedures will take place.

One month overdue

- At the beginning of the month, all individuals who were due for a fit test the prior month will receive a First Notice of Non-Compliance letter. This letter states that the employee must schedule and complete their fit test within 1 month or a Corrective Preventative Action Report (CPAR) will be generated. The letter also discusses when conditions must be met before having the fit test conducted.
- A copy of this letter is also sent to their supervisor or COTR and Human Resources
- If the employee shows up for the fit test, they are still considered non-compliant if:
 - the individual is not clean-shaven
 - has not had their training
 - did not pass their training exam
 - has not had their medical evaluation

Two months overdue

- A CPAR is issued.
- At the beginning of the month, all individuals who are two months overdue for a fit test will receive a Second Notice of Non-Compliance that notifies them that a C-PAR has been issued and states that the employee must schedule and complete their fit test within 1 month or they will be permanently removed from the program. The letter discusses consequences for not showing up at the fit test or rescheduling their appointment if necessary.
- The individual is prohibited from wearing their respirator or performing any tasks requiring the use of a respirator until they have a fit test performed.
- A copy of the letter is sent to their supervisor or COTR and Human Resources
- If the employee shows up for the fit test, they are still considered non-compliant if:
 - the individual is not clean-shaven
 - has not had their training
 - did not pass their training exam
 - has not had their medical evaluation

Three months overdue

- At the beginning of the month, individuals who are three months late in receiving their fit test will receive a Final Notice of Non-Compliance. The letter notifies them that they have been removed from the program and can no longer wear their respirator or perform any tasks requiring the use of a respirator at the NASA Glenn Research Center.
- This letter is sent to their supervisor or COTR and Human Resources
- The letter is also sent to medical services so they can update their records and remove the individual from the Respirator Medical Surveillance Program.
- The individual must return the respirator to the Industrial Hygiene Team or it will be collected by the IHT.
- If the individual needs to be in the program to perform their job, they cannot get back into the program until they and their supervisor meet with the IHT and discuss what changes will be made to ensure they remain compliant with the program requirements.

Reinstatement Process

- The employee's Division Chief completes a reinstatement petition located in Appendix C
- The employee's Branch Chief (or COTR for contractors) completes a reinstatement petition located in Appendix D
- The employee completes the reinstatement petition located in Appendix E
- The petition will be reviewed by the Occupational Health Lead of the Environmental Management Office to determine if the reinstatement request is the appropriate course of action.

Exposure Assessments

- Exposure assessments must be performed for all required users that show a representative sample of their exposure potential. These assessments will be performed by the IHT
- Exposure assessments must be performed within a year of a new user receiving a respirator or by 2004 for all other users.
- It is the responsibility of the respirator user to notify the IHT when they are going to be performing a task requiring the use of a respirator. This notification must give the IHT as much advanced notice as possible (ideally 1 week) so the appropriate sampling media and scheduling can be arranged.
- Individuals who fail to contact the IHT within a year of receiving their respirator or by 2004, will have 6 months to comply. If after 6 months, they do not comply, a C-PAR is issued. If the individual has not contacted the IHT after 2 years, the individual is removed from the program (this policy does not apply to "emergency use only" respirator use).

RECORDS

- Medical evaluations will be maintained by Medical Services and kept for the duration of an employee's employment plus thirty years.
- Fit testing records will be maintained by the IHT and kept for the duration of employment.
- Hazard Assessments will be maintained by the IHT
- Exposure Assessments will be maintained by the IHT

Safety and Assurance Directorate (SAAD)

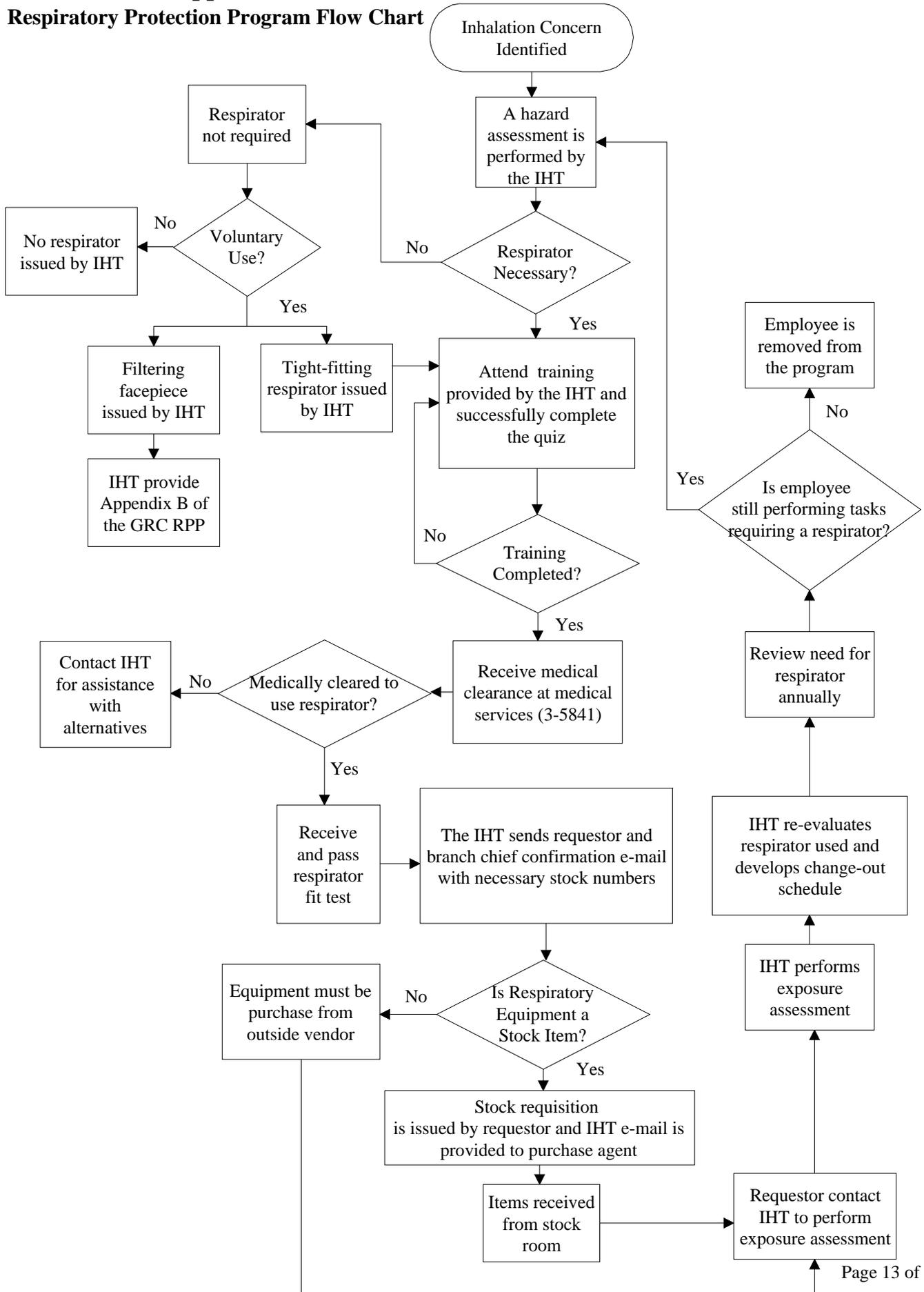
Environmental Management Office Chief: Michael J. Blotzer

Chapter Lead: Angela Windau, SAIC {<mailto:angela.d.windau@grc.nasa.gov>}

Web Curator: Sandra Jacobson, SAIC {<mailto:Sandra.Jacobson@grc.nasa.gov>}

Last revision: May 2004

Appendix A Respiratory Protection Program Flow Chart



Appendix B

Disposable Dust/Mist Respirator Mask Training

Please read the following information on filtering facepieces. If you have any questions, please feel free to contact me at 3-3073. Once you understand the information please sign at the bottom of this page along with your Branch Chief (or COTR if you are a contractor). Once you and your supervisor have signed this sheet and you completed the Dust Mask Form, please send them back to me at MS 6-4.

Thank you,

Angela

Always check with the Industrial Hygiene Team before using any type of respiratory protection to be sure that you are wearing the proper respirator for the inhalation hazard.

- Disposable dust masks are controlled stock items (requires Industrial Hygiene sign-off)
 - Require training.
 - No fit test required.
 - No medical spirometry test required.

- May be used for nuisance particulate levels only.
 - Particulate level below the action level. (Solid and non-oil based particles)
 - Minimum filter efficiency of 95%
 - Not for paints, oil aerosols, gases, vapors, asbestos or sandblasting.
 - Not for exposures over the action level for any particulates.
 - Not for particulates smaller than 0.3 microns
 - Examples for use: grinding, sanding, sweeping, bagging, dusty operations

- Donning the mask
 - Hold the mask with nosepiece at fingertips and the headbands hanging free.
 - Place mask firmly against face with nosepiece over the bridge of your nose.
 - Stretch top headband to the back of head above the ears.
 - Stretch bottom headband over head and position below ears.
 - Adjust the respirator for a comfortable fit. Use both hands to form metal nosepiece to shape of nose for a tight fit
 - Conduct a **positive pressure fit check** by cupping hands over mask and exhale slightly. If air leaks around the edges try to reposition the mask for a better fit.
 - Change respirator mask if breathing becomes difficult or if the mask becomes damaged or distorted.

I have read the requirements for safe dust mask use and understand them. By signing this document, I agree to comply with the requirements of dust mask use and the Glenn Respiratory Protection Program, Environmental Programs Manual Chapter 12.

Employee Name _____

Employee Signature _____

Date _____

Branch Chief/COTR Name _____

Branch Chief/COTR Signature _____

Date _____

Dust Mask Form

Date _____

Last Name _____ First Name _____
Job Title _____ Phone _____
Org Code _____ Mail Stop _____ Badge Number _____

Employer
 Akima Gilcrest QSS Other _____
 CHI Indyne SAIC
 Faculty NASA Student

Branch Chief/COTR Last Name _____
Branch Chief/COTR First Name _____

Smoker
Yes No

Job Task Description (task that respirator will be used for)

Frequency
 Daily More than once a week Once a month
 Once a week Every other week Every other month

Duration
 Less than 1 hour 2 hours 4 hours 6 hours Over 7 hours
 1 hour 3 hours 5 hours 7 hours

Contaminant(s) (be specific)

Building of Work _____ Room or Location _____

Controls Used
 Dust Suppression Local Exhaust/Ventilation - Hood Number _____
 Enclosure Scrubber None

Other PPE Used

Appendix C

Reinstatement Request for Respiratory Protection Program

(To be filled out by employee's second level supervisor)

I understand that _____ (employee name) has been removed from the respiratory protection program because they failed to comply with the requirements of the respiratory protection program despite the fact several letters were sent to them and their Supervisor requesting they comply. Wearing a respirator is an essential function in order for this employee to fulfill their job responsibilities; therefore, I am requesting that this employee be reinstated into the Center's Respiratory Protection program.

I understand that to protect my employee's safety, and meet OSHA requirements, employees must attend annual respiratory protection training to ensure they understand the purpose and limitations of the respirator. In addition, they must receive an annual medical assessment to determine if they are physically able to use the respirator and receive an annual respirator fit test to ensure the respirator adequately seals the employee's face. I have discussed these requirements with the employee and his or her supervisor and they too understand these requirements and that failure to comply with these requirements will result in the initiation of appropriate corrective action that may include disciplinary action.

Signature

Date

Please Print Name

Appendix D

Reinstatement Request for Respiratory Protection Program

(To be filled out by employee's supervisor)

I understand that _____ (employee name) has been removed from the respiratory protection program because they failed to comply with the requirements of the respiratory protection program despite the fact that I and the employee received several letters requesting they comply.

I understand that to protect my employee's safety, and meet OSHA requirements, employees must attend annual respiratory protection training to ensure they understand the purpose and limitations of the respirator. In addition, they must receive an annual medical assessment to determine if they are physically able to use the respirator and receive an annual respirator fit test to ensure the respirator adequately seals the employee's face.

I understand that as the supervisor of an employee wearing respiratory protection, my responsibilities include:

- Complete Respiratory Protection Program training
- Know the hazards and tasks that require respiratory protection and where they take place.
- Contact the Industrial Hygiene Team for hazard assessments
- Know the types of respirators and cartridges that need to be used.
- Ensure employees are knowledgeable about the respirator requirements for the areas in which they work and the tasks they perform.
- Ensure employees who are new to the department or task receive training on the hazardous tasks
- Enforce the requirements of the respiratory protection program in their area
- Ensure employees comply with the requirements of the Respiratory Protection Program

Failure to comply with these requirements will result in the initiation of appropriate corrective action that may include disciplinary action.

I understand and accept these responsibilities and requirements and will comply with them.

Signature

Date

Please Print Name

Appendix E

Reinstatement Request for Respiratory Protection Program

(To be filled out by employee)

I understand that to protect my safety, and meet OSHA requirements I have been enrolled in the Respiratory Protection Program

I understand that as an employee wearing respiratory protection, my responsibilities include:

- Comply with all aspects of the Respiratory Protection Program including:
 - Annual training to ensure I understand the purpose and limitations of my respirator
 - Annual medical evaluation to determine if I am physically able to use the respirator
 - Annual fit test to ensure the respirator adequately seals the my face
- Know the hazards and tasks that require respiratory protection and where they take place.
- Contacting the Industrial Hygiene Team for exposure assessment
- Proper use, cleaning, maintenance and storage of respirator
- Wearing the respirator I was fitted with
- Not allowing others to wear my respirator
- Wearing the correct cartridge, filter, or canister for the hazard I will be exposed to or call the Respirator Program Administrator when I am in doubt
- Performing a user seal check before entering into a hazardous environment
- Only wearing a respirator on a face that is clean shaven around the sealing surfaces of the respirator.

Failure to comply with these requirements may result in disciplinary action being initiated.

I understand and accept these responsibilities and requirements and will comply with them.

Signature

Date

Please Print Name
