



UNIVERSITY OF
TORONTO

ENVIRONMENTAL HEALTH & SAFETY

Respiratory Protection Program

University of Toronto

April 2009



Table of Contents

Respiratory Protection Program

Table of Contents	1
1.0 Introduction and Scope	2
2.0 Definitions.....	3
3.0 Responsibilities.....	5
4.0 Hazard Assessment.....	8
5.0 Selection of Respirators	9
6.0 Respirator Fit Testing.....	10
7.0 Training	11
8.0 Use of Respirators	12
9.0 Cleaning, Inspection, Maintenance, and Storage of Respirators	14
10.0 Medical Surveillance	16
11.0 Program Evaluation	17
12.0 Record Keeping	18
13.0 External Contractors	19
Appendix A: Classification and Description of Respirators By Mode of Operation	20
Appendix B: Respirator Selection Chart	22
Appendix C: Assigned Protection Factors.....	23
Appendix D: Procedures for Respirator Maintenance.....	24
Appendix E: University of Toronto Respirator User Screening Form	26



1.0 Introduction and Scope

Although elimination or reduction of respiratory hazards through substitution or engineering controls is preferred, there may be instances in which University workers require the use of appropriate respiratory protection for work, which involves exposure to potentially hazardous environments, such as airborne contaminants (dusts, fumes, mists, gases, vapours, aerosols, airborne pathogens) or oxygen-deficiency. The Canadian Standards Association (CSA) Standard Z94.4-02 (*Selection, Use and Care of Respirators*) requires a written respiratory protection program to be in place where respiratory protection is used to protect workers from inhaling hazardous atmospheres.

The basic elements of the Respiratory Protection Program are:

1. Education of employees on airborne hazards in the work place;
2. Selection of appropriate respirators;
3. Provision of respirator fit testing;
4. Provision of training in the proper use of respiratory protection;
5. Provision of appropriate procedures for cleaning, inspecting and storing respirators;
6. Provision of medical surveillance for workers using respiratory protection;
7. Provision for evaluating the effectiveness of this program;
8. Maintenance of training, fit testing, and medical surveillance records;
9. Control and monitoring of external contractors performing work in environments that require the use of respiratory protection.

Objective

It is the objective of this program to adequately protect the health of all workers coming into contact with hazardous atmospheres, where there is no possibility of implementing engineering or work practice controls. In addition, this program is meant to increase the awareness of respiratory hazards in the workplace and to inform employees of means available to protect themselves and others from those hazards.

Scope

This program applies to any worker who may be exposed to respiratory hazards during the course of work at the University.

Note: In this program, "worker" includes faculty, staff, students and visitors.



2.0 Definitions

Accepted respirator – a respirator tested and certified by procedures established by the National Institute for Occupational Safety and Health (NIOSH).

Air-purifying respirator – a respirator with an air-purifying filter, cartridge, or canister that removes specific contaminants by passing ambient air through the air-purifying element.

Atmosphere-supplying respirator – a respirator that supplies the respirator user with breathing air/gas from a source independent of the ambient atmosphere.

Fit test – the use of qualitative or quantitative method to evaluate the fit of a specific make, model, and size of a respirator on an individual.

Hazardous atmosphere – any atmosphere that is oxygen-deficient, exceeds occupational exposure limits, presents a fire/explosion hazard, and/or contains an airborne toxic or disease-producing contaminant in concentrations deemed to be hazardous.

Health Care Professional – an individual who is licensed by a provincial licensing authority or equivalent to practice medicine or nursing and who possesses relevant experience and knowledge in the field of occupational health and safety.

Immediately Dangerous to Life and Health Atmosphere (IDLH) – an atmosphere that poses an immediate threat to life, would cause adverse health effects, or would impair an individual's ability to escape.

Qualified Person – an individual who possesses the knowledge, experience, and training to fulfil the competencies of the roles defined in this Program.

Quantitative fit test – a test method that uses an instrument to assess the amount of leakage into the respirator in order to assess the adequacy of respirator fit.

Qualitative fit test – a pass/fail test method that relies on the subject's sensory response to detect a challenge agent in order to assess the adequacy of respirator fit.

Respirator – a device to protect the user from inhaling a hazardous atmosphere.

Service Life – the period of time during which a respirator provides adequate protection to the user.

User seal check – an action conducted by the respirator user to determine if the respirator is properly sealed to the face.



Tight-fitting facepiece – a respirator inlet covering that forms a complete seal with the face. This includes a half-facepiece that covers the user’s nose and mouth under the chin; and a full-facepiece that covers the user’s nose, eyes, and mouth under the chin.



3.0 Responsibilities

3.1 Principal Investigators/Supervisors and All Others in Authority

Principal Investigators/supervisors and all others in authority shall:

- Identify situations where respirators are required;
- Conduct, in consultation with the Office of Environmental Health and Safety, assessments for respiratory hazards;
- Determine (using the Respirator Standard or in conjunction with the Office of Environmental Health and Safety) the type of respiratory protection required for the specific respiratory hazard;
- Provide workers with appropriate respiratory protection;
- Ensure that health screening, training and fit testing of workers are completed prior to assigning workers a task that requires a respirator;
- Ensure that workers use the respirators in accordance with the instructions and the training received;
- Ensure that the workers use only those respirators for which they have been qualified;
- Ensure respirators are cleaned, sanitized, inspected, maintained, repaired, and stored in accordance with training and manufacturer's recommendations;
- In case of a tight-fitting facepiece, ensure that respirator users are clean-shaven and do not have any object or material that would interfere with the seal or operation of the respirator;
- Notify the Office of Environmental Health and Safety (EHS) of respirator users' concerns, changes in processes, equipment, or operating procedures that have impact on environmental conditions, and respiratory protection requirements;
- Notify the Office of Environmental Health and Safety of the incidents where the use of a respirator may have prevented or contributed to an accident or injury;
- Provide details of the type of respirator selected and the anticipated working conditions to the health care professional conducting the medical assessment of a respirator user and;
- Ensure that workers wear appropriate respiratory protection at all times in respiratory hazard areas.

3.2 Workers (Respirator Users)

Workers (Respirators Users) shall:

- Wear appropriate respiratory protection at all times when performing tasks or working in an area where respiratory hazards exist;
- Inspect the respirator prior to each use in accordance with the training received;



- Clean, maintain and store the respirators in accordance with the training received and the manufacturer's instructions;
- Perform negative and positive pressure check after each donning of a tight- fitting respirator;
- Report any damage or malfunction of the respirator to their supervisor;
- Report to their supervisor or other person in authority any condition or change that may impact on their ability to use a respirator safely;
- When using a tight-fitting facepiece respirator, be clean shaven and ensure that no object or material interferes with the seal or operation of the respirator;
- Use the respirator in accordance with the written instructions and training received.

3.3 Office of Environmental Health and Safety (EHS)

The Occupational Hygiene and Safety section of the Office of Environmental Health and Safety is responsible for all aspects of the Respiratory Protection Program. This includes:

- Developing and administering the program;
- Providing technical advice and recommendations regarding assessments for respiratory hazards;
- Assisting supervisors in determining the type of respiratory protection required for the specific respiratory hazard(s);
- Providing training and education;
- Fit testing;
- Evaluating of Respiratory Protection Program effectiveness;
- Ensuring that procedures for health surveillance are established;
- Updating the program to maintain consistency with regulatory criteria and consensus standards;
- Creating and maintaining training and fit testing records;

3.4 Health and Well-Being Programs and Services (HWB)

The Occupational Health Service - Health and Well-Being Programs and Services shall:

- Have knowledge of the health effects associated with the respiratory hazards to which the user might potentially be exposed;
- Have knowledge of the physiological burden and psychological stresses associated with the use of the selected respirator under the anticipated working conditions;
- Assess the suitability of the user to safely use the selected respirator;
- Determine what tests, evaluations, etc., are necessary to make the determination whether an employee is medically fit to wear respiratory protection equipment;



- Report to the program administrator whether the user meets medical requirements, medical requirements with limitations, or does not meet medical requirements to use the selected respirator;
- Perform medical surveillance, as appropriate, for specific hazardous respiratory toxins, allergens, or pathogens;
- Maintain medical records.



4.0 Hazard Assessment

In order to determine the presence of a respiratory hazard and to assist in selection of an appropriate respirator, a hazard assessment of the work area shall be conducted by the supervisor in consultation with EHS. The hazard assessment of a respiratory hazard includes the following:

- Identification of contaminants (chemical, biological) that may be present in the workplace;
- Identification of physical states of all airborne contaminants;
- Determination of the likelihood of inhalation of the contaminants;
- Measurement or estimation of the concentration of the contaminants;
- Determination of oxygen level (potential oxygen deficiency);
- Identification of appropriate occupational exposure limit for each airborne contaminant;
- Determination of whether the atmosphere is immediately dangerous to life and health (IDLH);
- Determination of existence of adequate warning properties;
- Determination of skin or eye absorption and irritation characteristics.

In instances where exposure cannot be identified or reasonably estimated, the atmosphere shall be considered IDLH.



5.0 Selection of Respirators

5.1 Respirators shall be selected based on the following criteria:

- Health of the worker and ability to wear a respirator;
- Review of the hazard assessment;
- Existing legislation and standards;
- Work requirements and conditions;
- Duration of exposure;
- Characteristics and limitations of respirators;
- Respirator assigned protection factors (Appendix D).

5.2 Only accepted respirators shall be selected and used.

5.3 Respirators shall be selected by supervisors in consultation with EHS.

5.4 Respirator Selection Chart (Appendix B) can be used to assist in the selection of an appropriate respirator.

5.5 Workers shall be issued only those respirators for which they have been fit tested and medically approved.

5.6 For air-purifying respirators for gases and vapours with no end-of-service- life indicator, the supervisor shall establish a change-out schedule for the replacement of the cartridges. Should the need arise, EHS can assist the supervisor with setting up the change-out schedule.

5.7 Where an IDLH atmosphere is identified, only pressure-demand self- contained breathing apparatus (SCBA) or a combination pressure-demand supplied air respirator with auxiliary self-contained air supply, with a minimum rated service time of 15 minutes shall be used.

5.8 Respirators approved for escape only shall not be used for non-emergency applications.

5.9 Atmosphere-supplying respirators that make use of compressed air for breathing shall meet the standards set out in Table 1 of CSA Standard Z180.1-00, Compressed Breathing Air and Systems (March, 2000).

5.10 Atmosphere-supplying respirators that make use of ambient breathing air system shall have the air intake located in accordance with Appendix B of CSA Standard Z180.1-00, Compressed Breathing Air and Systems (March, 2000).



6.0 Respirator Fit Testing

- 6.1** The workers must pass an appropriate quantitative or qualitative fit test when using a respirator with a tight-fitting face piece.
- 6.2** The fit testing shall be conducted by Occupational Hygiene and Safety section of the Office of Environmental Health and Safety.
- 6.3** A fit test shall be carried out
- a) prior to initial use of a tight-fitting respirator
 - b) every 2 years
 - c) whenever there is a change in respirator facepiece (make, model, or size)
 - d) whenever the employee reports, or the health care professional, supervisor, or EHS makes visual observations of changes in the employee's physical condition that could affect respirator fit. Such conditions include, but not limited to:
 - facial scarring
 - dental changes
 - cosmetic surgery
 - obvious change in body weight
 - facial rash (dermatological condition)
- 6.4** The worker shall be fit tested with the same make, model, style and size of respirator to be used.
- 6.5** The fit test shall be performed only on workers who are clean-shaven where the facepiece seals to the skin.
- 6.6** When a worker is required to wear other personal protective equipment, such as eye, face, head and hearing protection during his/her course of work, the same protective equipment shall be worn during the fit test to ensure that they are compatible with the respirator and do not break the facial seal.



7.0 Training

- 7.1** All workers whose work requires the use of a respirator shall receive appropriate training and education.
- 7.2** The workers shall receive training prior to the initial use of the respirator.
- 7.3** Training shall be provided by EHS.
- 7.4** The training shall include the following:
- Why respiratory protection is necessary;
 - The limitations and capabilities of respiratory equipment;
 - Respiratory hazard assessment;
 - Logic for selecting a particular type of respirator;
 - How to inspect, put on and remove a respirator, and how to perform user seals checks;
 - Procedures for maintenance and storage of respiratory equipment;
 - How to recognize medical signs and symptoms that may limit or prevent the effective use of the respirator;
 - General requirements of the Respiratory Protection Program.
- 7.5** Refresher training shall be provided every two years to all respirator users.
- 7.6** Records of the training shall be updated and maintained by EHS.
- 7.7** Training in the use of self-contained breathing apparatus (SCBA), if required, shall be provided by a qualified external trainer.



8.0 Use of Respirators

- 8.1 Prior to being assigned any task that requires the use of a respirator, the worker shall complete all the health screening, fit testing and training requirements.
- 8.2 Workers with facial hair that may interfere with the facepiece seal or valve function on tight-fitting respirators cannot use a tight-fitting respirator.
- 8.3 Other personal protective devices or equipment shall not interfere with the seal of the facepiece to the face of the worker.
- 8.4 Side arms on eyeglasses or any other material such as hair, cloth, tissue, straps and jewellery shall not pass between the face and the sealing surface of the facepiece or interfere with the seal of the tight-fitting facepiece to the face or with the operation of the respirator. Workers who must have corrective eyewear, where the eyewear interferes with the respirator seal, shall be provided with respirator spectacle kits by their department.
- 8.5 The worker shall check the seal of the facepiece immediately after putting on the respirator.
- 8.6 The worker should never break the respirator face-to-facepiece seal to communicate.
- 8.7 Workers shall not remove their facepieces at any time while working in an IDLH atmosphere.
- 8.8 Workers shall be permitted to leave the hazardous area for any respirator- related reason. The worker shall leave the hazardous area when:
- The respirator fails to provide adequate protection;
 - The respirator malfunctions;
 - He/she detects air leakage around the face seal;
 - He/she detects an odour or tastes a chemical;
 - He/she has increased breathing resistance;
 - He/she experiences any illnesses or discomforts such as dizziness, nausea, weakness, breathing difficulties, sneezing, fever, chills, confusion, etc.;
 - He/she experiences extreme discomfort from wearing the respirator;
 - He/she needs to wash his/her face and facepiece to minimize skin irritation;
 - Components (including air tanks) or purifying devices need change-out.
- 8.9 The respirator shall not be altered in any manner.



- 8.10** All cartridges, replacement parts, etc., shall be from the same manufacturer as the respirator (e.g., use only NORTH cartridges and parts for a NORTH respirator).
- 8.11** Where respirators are used for HAZMAT response, confined space entry etc.; the appropriate existing legislation, regulations, standards and guidelines shall be consulted.



9.0 Cleaning, Inspection, Maintenance, and Storage of Respirators

- 9.1** The University shall provide each worker requiring a respirator with a respirator that is clean, sanitary and in good working order.
- 9.2** Each worker issued a respirator shall properly maintain his/her respirator to retain its original effectiveness. The maintenance shall include:
- Cleaning and sanitizing
 - Inspection and testing
 - Proper storage
- 9.3** The respirator shall be cleaned and sanitized according to the respirator manufacturer's instructions and/or according to procedures found in Appendix D – Procedures for Respirator Maintenance.
- 9.4** The frequency of cleaning shall depend on how many workers use the respirator and what it is used for.
- Respirators issued to individual workers shall be cleaned and disinfected as often as necessary to maintain proper hygiene.
 - A single respirator issued to multiple workers must be cleaned and disinfected before each use.
 - Respirators designated for emergency use only must be cleaned and disinfected after each use.
- 9.5** The worker shall inspect his/her respirator before and after each use. The procedure for respirator inspection is found in Appendix D – Procedures for Respirator Maintenance.
- 9.6** The SCBA cylinders shall be inspected by a qualified person according to the requirements of CSA Standards CAN/CSA-B339 and CAN/CSAB-340, the appropriate CGA publications C-6, C-6.1, and C-6.2 the Transport Canada Regulations under the Transportation of Dangerous Goods Act, and the manufacturer's instructions.
- 9.7** The emergency SCBA shall be inspected on a schedule to ensure readiness for the anticipated emergency use.
- 9.8** The records of all inspections and service performed on an SCBA respirator and cylinder shall be maintained by the person responsible for the unit.
- 9.9** The worker shall report defective or non-functioning respirators to his/her supervisor. These respirators shall be tagged and removed from service by the supervisor until repaired or replaced.



- 9.10** Any respirator and cylinder repairs, and subsequent tests and checks shall be performed by the unit manufacturer or by a qualified external contractor. Defective or non-functioning half mask facepieces shall not be repaired but will be disposed and replaced instead.
- 9.11** The worker shall store their respirators in a clean and sanitary location, in boxes or in plastic bags, marked with each worker's name. The respirators shall be stored in a manner that will protect them from dust, ozone, sunlight, heat, extreme cold, excessive moisture, vermin, damaging chemicals, oils, greases, or any other potential hazard that may have a detrimental effect on the respirator.
- 9.12** When packed or stored, each respirator should be positioned to retain its natural configuration.
- 9.13** Used cartridges/filters to be reused shall be stored in a manner to prevent contamination of the respirator facepiece.



10.0 Medical Surveillance

- 10.1** Prior to fit testing and respirator use, it shall be confirmed that the worker is free from any physiological or psychological condition that may prevent him or her from being assigned the use of the selected respirator. This shall be achieved through the use of the Respirator User Screening Form.
- 10.2** The worker and his/her supervisor shall complete their respective parts of the Respirator User Screening Form and send the form to EHS prior to fit testing.
- 10.3** Where, based on the Respirator User Screening Form, EHS is concerned that a physiological or psychological condition exists that may preclude the use of a respirator, EHS shall refer the worker to Occupational Health in HWB for a medical evaluation.
- 10.4** The medical evaluation shall consist of a primary assessment conducted by the Occupational Health Nurse and if deemed necessary a further assessment conducted by the Occupational Health Physician.
- 10.5** The worker, his or her supervisor, and EHS shall provide the Occupational Health Nurse and/or the Occupational Health Physician with information regarding the conditions of the respirator use and the type of respirator(s) required.
- 10.6** After the medical evaluation, the Occupational Health Physician shall provide OEHS with a written opinion regarding the employee's ability to use a respirator. The opinion shall indicate one of the following:
- a) User meets medical requirements to use the selected respirator;
 - b) User meets medical requirements to use the selected respirator with limitations;
 - c) User does not meet medical requirements to use the selected respirator.
- 10.7** The re-evaluation of the worker shall not be performed on an annual basis. The re-evaluation shall be performed based on one of the following criteria:
- a) The worker reports signs or symptoms that are relevant to the worker's ability to use a respirator;
 - b) The Occupational Health Physician, supervisor or OEHS considers it necessary for the worker to be re-evaluated;
 - c) A change in workplace conditions occurs that may result in substantial increase in the physiological burden that respirator use places on the worker.

Workers who do not meet medical requirements to use a selected respirator shall not work in an area where the use of a respirator is required.



11.0 Program Evaluation

11.1 The Respiratory Protection Program shall be reviewed annually by EHS.

11.2 The review of the program shall include:

- a) A review of program elements against regulatory requirements;
- b) A review of definitions of roles and responsibilities;
- c) A review of documented program procedures;
- d) Examination of records to verify that documented procedures are being followed;
- e) Confirmation that workplace practices comply with program requirements;
- f) Documentation of performance problems and subsequent resolution or corrective action plans;
- g) Stakeholder input to verify worker acceptance (comfort, ease of breathing, fatigue, vision, mobility, job interference, utility);
- h) Proper selection and use of respirators;
- i) Effective training of all stakeholders;
- j) Proper inspection of respirators; and
- k) Proper storage and maintenance of respirators.

11.3 EHS shall review the information derived from the medical monitoring performed, where available.



12.0 Recordkeeping

12.1 Supervisors shall maintain records of the following:

- a) Training for workers under their supervision
- b) Respirator selection
- c) Inspection, maintenance and storage

12.2 EHS shall maintain the records of the following:

- a) Fit testing
- b) Training
- c) Hazard assessment
- d) Respirator selection
- e) Program evaluation

12.3 The fit testing records shall consist of the

- a) name and identification of the worker tested
- b) type of test performed
- c) make, model and size of the respirator fitted
- d) date of the fit test
- e) result of the fit test
- f) name of the person conducting the fit test

12.4 Occupational Health Service - HWB shall maintain the medical records for the workers that had undergone medical evaluations. These records shall be treated as medically confidential.



13.0 External Contractors

- 13.1** All external contractors must be able to demonstrate compliance with the requirements outlined in this program.
- 13.2** Before authorizing work in an area where a respiratory hazard has been identified, the department retaining the contractor shall provide a report to the prospective contractor as part of the work specification. The report shall contain the hazard assessment of the area.
- 13.3** External contractors must provide written evidence that their workers have undergone a medical evaluation, received appropriate respiratory training and that they have been fit tested for the appropriate respirators.



Appendix A

Classification and Description of Respirators by Mode of Operation

1) Air-Purifying Respirators

Air-purifying respirators can be used to protect against airborne contaminants such as dusts, mists, fumes, smokes, aerosols, gases and vapours. **Since these respirators are *air-purifying* only, this type of respiratory protection must NEVER be used in oxygen-deficient atmospheres or situations that are immediately dangerous to life and health (IDLH).**

The general categories of air-purifying respirators are:

- a) **Particulate (dust, fume and mist)**
- b) **Gas and Vapour**
- c) **Combination of Particulate and Gas/Vapour**

The air-purifying respirators are available in two modes of operation: 1) Non- powered and 2) Powered. The non-powered respirators come in two designs: 1) half mask and 2) full facepiece. (Quarter mask and mouthpiece respirators are also available but are not recommended). The powered respirators contain a blower and are equipped with a facepiece, helmet or hood.

2) Atmosphere-Supplying Respirators

a) **Supplied Air Respirators**

The supplied air respirator consists of a half-mask, full facepiece, hood or helmet to which respirable air is supplied through a small diameter hose. Two types of flow may be used: 1) continuous-flow to the mask in which the flow maintains the mask under positive pressure at moderate work rates; and 2) pressure-demand, which keeps the mask under positive pressure at moderately high work rates but limits the air quantity used to that required for breathing. Demand airflow, which allows the pressure inside the mask to become negative during inhalation, is not recommended because it does not provide as much protection. The respirable supplied-air comes from A) a compressor or B) compressed air cylinder(s).

Supplied air respirators may be used in IDLH or oxygen-deficient atmospheres only if an auxiliary tank of air is incorporated into the respirator system.

b) **Self-Contained Breathing Apparatus (SCBA)**

SCBAs comprise of a full facepiece connected to a source of air carried by the wearer. The SCBAs provide respiratory protection in oxygen-deficient environments and in situations where high or unknown concentrations of toxic gases, vapours or particulates are present. The SCBA can also provide protection in emergency



situations. When using an SCBA, the user's respiratory system is isolated from the surrounding atmosphere because no outside air is admitted into the respirator facepiece. There are three types: 1) open-circuit devices; 2) closed- circuit (re-breathing) devices; and 3) escape units. Two types of flow are available: 1) pressure demand and 2) demand. The demand SCBAs must not be used in oxygen-deficient atmospheres or IDLH atmospheres because they allow the pressure inside the facepiece to become negative.

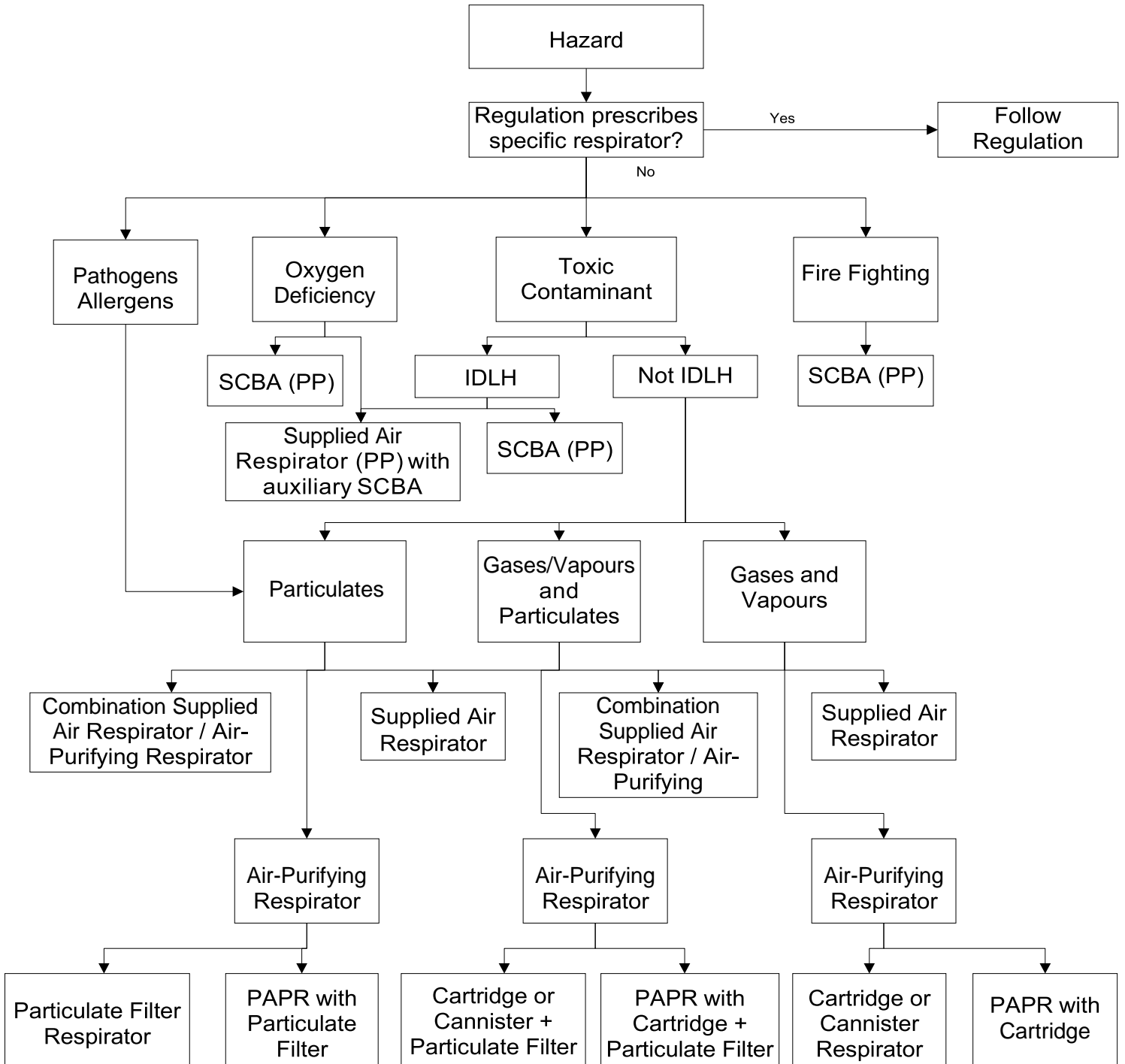
3) Combination Atmosphere-Supplying and Air-Purifying Respirators

These devices usually consist of an atmosphere-supplying respirator with an auxiliary air-purifying attachment that provides protection in the event that the air supply fails. A combination atmosphere-supplying respirator with an auxiliary air- purifying element may be used only when the concentration of airborne contaminants in the workplace does not exceed the maximum use concentration of the respirator when used in the air-purifying mode.



Appendix B

Respirator Selection Chart



SCBA – Self Contained Breathing Apparatus
 PP – Positive Pressure
 IDLH - Immediately Dangerous to Life and Health
 PAPR - Powered Air-Purifying Respirator



Appendix C

Assigned Protection Factors (APF)

Respirator class	Respirator Style				
	Quarter Facepiece	Half Facepiece	Full Facepiece	Helmet/ hood	Loose-fitting Facepiece/visor
Air-purifying (negative pressure)	5	10	100 (NIOSH=50)		
Powered air-purifying		50	1000	1000 NIOSH=25 OSHA =25	25
Supplied-air (demand)		10	100 (10 if QLFT used)		
Supplied-air (pressure demand)		50	1000		
Supplied-air (continuous flow)		50	1000	1000	25
SCBA (demand)		10	100 (10 if QLFT used)		
SCBA (pressure)			*	*	

CSA Z94.4-02 Selection, Use, and Care of Respirators (with NIOSH where different)

*1OSHA specifies 25 for an untested hood, and 1000 for an accepted tested hood.

APF – the anticipated level of respiratory protection that would be provided by a properly functioning respirator or class of respirators to properly fitted and trained users.

QLFT – Qualitative fit test

* Pressure-demand SCBAs are currently regarded as providing the highest degree of protection. Limited simulated workplace studies have concluded that all users may not be able to achieve



assigned protection factors (APF) of 10000. Therefore, based upon this data, a definitive APF could not be assigned for pressure-demand

Appendix D

Procedures for Respirator Maintenance

The principal aspects of respirator care include: cleaning/disinfecting, inspection, storage and repair.

A. Cleaning and Disinfecting

- 1) Remove filters, cartridges, or canisters. Disassemble facepiece. Discard or repair any defective parts.
- 2) Wash components in warm (43°C maximum) water with mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle brush may be used to remove any dirt.
- 3) Rinse components thoroughly in clean, warm, preferably running water. Drain.
- 4) When the cleaner used to clean the respirator does not contain a disinfecting agent, respirator components should be fully immersed for 2 minutes in one of the following:
 - a) sodium hypochlorite solution – 1mL of bleach to 1L of water
 - b) aqueous solution of iodine – 0.8mL of tincture of iodine to 1L of water
 - c) other commercially available cleaners of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- 5) Rinse components thoroughly in clean, warm, preferably running water. Drain.
- 6) Components should be allowed to air dry or be hand dried with a clean, lint free cloth.
- 7) Reassemble the facepiece, replacing filters, cartridges, and canisters where necessary.

Disinfection (steps 4 & 5) is not required for a respirator used by only one worker. For multiple users, however, the respirator must be cleaned and sanitized before it is transferred to another person for use.

The disinfecting solution must not damage the respirator and must not cause skin irritation to the respirator wearer. Proper rinsing of the respirator is important to ensure that this does not happen.

B. Inspecting

- a) Check the condition of component parts:
 - Check condition of the facepiece, looking for cracks, cuts, tears, holes and distortion of facepiece;
 - Check head straps to ensure they are properly attached and have elasticity;
 - Check head straps for broken buckles and breaks and tears;



- Check inhalation and exhalation valves to ensure that they are in place and are not damaged;
 - Check all rubber or flexible parts for cracks and pliability;
 - Check cartridges, canisters, and filters to ensure that they are not spent;
 - Check for cracks or damage to cartridge, filter, or canister;
 - Check the breathing tube (if present) for cracks, holes, missing or loose clamps, and broken or missing end connectors;
 - Check the hood, helmet or, suit (if present) for ripped or torn seams, and for cracks or breaks in the face shield.
 - Check the PAPR assembly (PAPR users only)
- b) Check the tightness of connections between cartridges, filters and the respirator facepiece.
- c) Check the end-of-service-life indicator (if present).
- d) Check the expiration date on the side of the cartridge, filter, or canister.
- e) Check proper functioning of regulators, alarms, and other warning systems (not required on air purifying respirators).
- f) If using supplied air, check the air quality of the air supply.



Appendix E

University of Toronto Respirator User Screening Form

Parts A through of this form to be completed by the supervisor of the respirator user.

A: Respirator User Information

Date: _____

Last Name: _____ First Name: _____

Personnel Number: _____

Employing Department: _____

Job Title: _____

Telephone: (_____) _____ Fax: (_____) _____

B: Conditions of USE

Activities requiring respirator use: _____

Frequency of respirator use:

- Daily
- Weekly
- Monthly
- Yearly
- Uncertain

Exertion of level during use:

- Light
- Moderate
- Heavy
- other

Duration of respirator use per shift:

- <1/4hr
- >1/4hr
- >2hr
- Variable
- Unknown

Temperature during use:

- <0C
- >0C and <25C
- >25cS
- Yearly
- Uncertain

Atmospheric pressure during use:



- Reduced Normal/ambient increased

Special Work Considerations

Uncontrolled Hostile Environment:

- Emergency escape Police activity IDLH
- Oxygen deficiency Confined spaces Hazardous materials (Emerg.)
- Other _____

Other Personal Protective Equipment (PPE)

- Additional types of PPE equipment required. Specify: _____
- Estimated total weight of tools/equipment carried during respirator use:
Maximum: _____ Average: _____

C: Types of Respirators to Be Used (check all that apply)

- Tight-fitting Non-tight fitting (e.g. hood)
- Mouth bit Air-purifying, non-powered
- Air-purifying, powered Supplied-air, demand
- Supplied-air, continuous flow Supplied-air, pressure demand
- SCBA-closed circuit SCBA-open circuit
- SCBA-escape SCBA-closed circuit escape
- Combination pressure demand/supplied-air with escape
- Combination supplied-air with air-purifying elements
- Supplied-air suit
- Other – specify: _____

Signature of Supervisor: _____ Date: _____

Part D of this form to be completed by the respirator user.

D: Respirator User’s Health Conditions

- a) Some conditions can seriously affect your ability to safely use a respirator. Do you have or do you experience any of the following, or other conditions that may affect respirator use? (Check YES or NO box only. Do not specify.)



YES NO

- | | |
|---|------------------------|
| Shortness of breath | Breathing difficulties |
| Chronic bronchitis | Emphysema |
| Lung disease | Severe Allergies |
| Heart problems | Chest pain on exertion |
| Hypertension | Cardiovascular disease |
| Thyroid problems | Diabetes |
| Neuromuscular disease | Fainting spells |
| Dizziness/nausea | Seizures |
| Temperature susceptibility | Panic attacks |
| Claustrophobia | Fear of heights |
| Dentures | Hearing impairment |
| Colour blindness | Asthma |
| Vision impairment | Reduced sense of smell |
| Pacemaker | Reduced sense of taste |
| Facial features/skin conditions | Back/neck problems |
| Prescription medication to control a condition | |
| Other condition(s) that may affect respirator use (e.g. lung problems): | |

b) Have you had previous difficulty while using a respirator?

YES NO

c) Do you have any concerns about your future ability to use a respirator safely?

YES NO

Signature of Respirator User: _____ Date: _____



Part E of this form to be completed by Occupational Health Nurse.

E: Health care professional primary assessment (if required)

Assessment date: _____

- Respirator use permitted?: YES NO UNCERTAIN
 Referred to medical assessment: YES NO

Comments:

Reassessment date: _____

Name of Health Care Professional (HCP): _____

Title: _____

Signature of HCP: _____

Part F of this form to be completed by Occupational Health Physician

F: Medical Assessment (if required)

Assessment Date: _____

- Class 1. NO restrictions
 Class 2. Some specific restrictions apply: _____

 Class 3. Respirator use is NOT permitted

Name of Physician: _____

Signature of Physician: _____