



A Health and Safety Guideline for Your Workplace

Fire Protection

Introduction

Fire Protection is an organized approach designed to prevent fires. In the event of a fire, a fire protection program will help prevent or minimize personal injuries, and losses.

This guideline is designed to help you develop a fire protection program, or to identify areas in your existing program that may need improvement.

The elements of a fire protection program are discussed below.

Workplace Assessment

Your first step is to do a workplace assessment. You will be evaluating your workplace for:

- z fire hazards;
- z effectiveness of controls;
- z emergency preparedness.

Collect as much information as possible on each of the areas shown in Appendix 1. This should include hazard and control information, as well as relevant legal standards and requirements. An inventory of hazardous materials used in your workplace will prove useful.

Follow this up with a walk-through assessment of your workplace. Using the information you have collected, develop a basic floor plan and an assessment checklist for this purpose. Use the checklist to record your observations.

The results of your workplace assessment will help you determine the need to improve or implement:

- z fire prevention and control procedures;
- z an emergency plan.

Fire Prevention and Control

The best way to protect your employees and property is to prevent a fire from happening. The most effective way to do this is to eliminate or minimize all fire hazards.

If a fire does occur, however, immediate steps should be taken to control it, and prevent it from spreading.

Fire prevention and control are achieved by combining engineering, work practice and administrative controls. Appendix 2 provides some examples of each of these controls.

Emergency Plan

A fire emergency plan outlines a sequence of steps to be taken when a fire strikes. Its purpose is to ensure the safety and health of employees, and to minimize the damage to property.

Your plan should provide for “worst case” scenarios. Guidelines are provided in Appendix 3 to help you in preparing your plan.

Fire Inspections

Establish a regular schedule of fire inspections. These will help detect any deviations from, or shortcomings in, your control standards and emergency procedures. Take corrective action as soon as possible.

Appendix 4 is a sample checklist you can use to monitor your fire protection program. You will, of course, need to expand on the points provided under each general heading. The information collected during your workplace assessment, and subsequent action taken, will help you to come up with your own detailed checklist.

Carry out a complete assessment whenever you make changes in your workplace, such as a change in process, work activity or materials used.

Related Legislation

Ontario Regulations for Industrial Establishments:

- z Section 121 & 124 specify that certain requirements of the *Building Code* and *Fire Code* apply to industrial establishments.

These Regulations also contain provisions with respect to:

- z storage of flammable liquids (s. 26);
- z portable containers for dispensing flammable liquids (s. 27).

Ontario Fire Code:

- z Part 2: Building and Occupant Fire Safety – contains provision for:
 - fire separations (s. 2.2);
 - fire hazards (s. 2.4);
 - fire department access to buildings (s. 2.5);
 - service equipment (s. 2.6);
 - safety to life (s. 2.7);
 - emergency planning (s. 2.8).
- z Part 3: Property Protection for Industrial and Commercial Occupancies.
- z Part 4: Flammable and Combustible liquids (Reserved)*.
- z Part 5: Hazardous Materials, Processes and Operations.
- z Part 6: Fire Protection Equipment.
- z Part 7: Inspection, Testing and Maintenance of Fire Emergency Systems in High Buildings.
- z Part 9: Retrofit.

* In the meantime, consult the *National Fire Code of Canada* 1990, Part 4.

Ontario Building Code:

- z Part 3: Use and Occupancy – specifies requirements for:
 - fire alarms and detection systems (s.s. 3.2.4);
 - fire fighting (s.s. 3.2.5);
 - lighting and emergency power systems (s.s. 3.2.7);
 - standpipe and hose systems (s.s. 3.2.9);
 - requirements for exits (s. 3.4).

Ontario Hydro Electrical Safety Code:

- z Section 18: Hazardous Locations.

Appendix 1

Assessing Your Workplace

Areas to Be Assessed	Comments
<p>Work Processes/Activities</p> <ul style="list-style-type: none">z potential fire hazards (sources of ignition, and their location)z high risk areas (e.g., piping or tanks)z appliances, mechanical/electrical equipment usedz hazardous materials used, amounts, and characteristics (flammable, explosive, reactive, toxic, corrosive, oxidizing, compressed gases)z hazardous by-products (e.g., explosive dusts)	
<p>Building</p> <ul style="list-style-type: none">z floor layout (stairs, exits, access to exits)z building materials (fire-resistance ratings)z storage areasz emergency lightingz fire detectors and suppressors (smoke detectors, automatic sprinklers)	
<p>People (employees, visitors, community)</p> <ul style="list-style-type: none">z number that might be affectedz characteristics (consider any disabilities that would affect their ability to evacuate)z location:<ul style="list-style-type: none">- inside building (control rooms, offices)- outside building (storage yards)- neighborhood (homes, schools)	
<p>Controls</p> <ul style="list-style-type: none">z engineering controlsz work practicesz administrative controlsz fire containment (extinguishers)z flammable spills containment (e.g., dykes, containment ponds, or isolation valves)	

Appendix 2

Examples of Fire Controls

Engineering

- z **Process alteration**
- z **Substitution with less hazardous process materials**
(the Chemical Referral Centre of the Canadian Chemical Producers' Association may be able to help in this regard; their toll-free number is 1-800-267-6666).
- z **Workplace design**
 - proper storage facilities (properly marked);
 - proper ventilation;
 - fire proofing of buildings;
 - installation of fire/heat/smoke detectors;
 - proper fire doors, and sprinkler systems;
 - control of explosive atmospheres (e.g., dusts);
 - adequate spill containment.
- z **Elimination of ignition sources**
 - static electricity;
 - electrical equipment (should be intrinsically safe and must be certified by the Canadian Standards Association or the Ontario Hydro Electrical Inspection department);
 - machinery (proper maintenance)
 - friction.
- z **Consult a fire protection engineering consultant, if necessary**

Work Practices

- z **Housekeeping**
 - adequate waste disposal;
 - exit/fire escape access;
 - unobstructed aisles;
 - control of flammable dusts.
- z **Proper storage of flammables and combustibles**
- z **Company policies**
 - no smoking;
 - hot work permits.

- z **Use of approved portable safety containers for the dispensing of flammable liquids**
- z **Bonding/grounding**
- z **Proper use and maintenance of electrical equipment**
- z **Proper selection and use of fire extinguishers**

Administrative

- z **Fire Safety Plan**
(You may be required to have your plan approved by your local Fire Chief. See Section 2.8 of the *Ontario Fire Code*).
- z **Fire Inspections**
 - establish schedule (daily, weekly, monthly);
 - by whom (internal: fire brigade members; external: fire department, insurance company);
 - by work area or department;
 - record keeping and follow-up.
- z **Review**
 - new construction;
 - change in process design;
 - similar industry experiences;
 - changes to legislation (fire/building codes);
 - smoking policy;
 - hot work permit procedures;
 - plant security.
- z **Employee training (including induction training and retraining) in:**
 - preventive measures;
 - inspection techniques;
 - fire extinguisher use;
 - hazard reporting;
 - emergency procedures.
- z **Test**
 - employee knowledge of fire prevention procedures, and application of knowledge.

Appendix 3

Guidelines for an Emergency Fire Plan

Assign responsibilities at all levels for each of the following areas.

Communications

Install a communications system, and establish procedures to:

- z **Alert occupants**
 - alarm systems.
- z **Mobilize fire fighters**
 - municipal fire departments;
 - plant fire brigade.
- z **Meet fire department on arrival, and advise them on:**
 - location of fire;
 - contents in and near the location;
 - trapped people.
- z **Make contact with:**
 - neighboring industries that could be at risk;
 - police;
 - ambulance;
 - hospital;
 - workplace security.
- z **Test communications system regularly**
- z **Mark all exists clearly**

Fire Extinguishment

Organize a fire brigade, and provide training in:

- z **Proper procedures**
 - take into account the volume of flammable materials, and areas at high risk of destruction;
- z **Shutdown of processes;**
- z **Use of equipment**
 - hoses
 - personal protection
 - etc.
- z **Use of emergency lighting and power sources;**
- z **Emergency plant access for fire trucks and ambulances.**

Safety of People

To ensure the safety of all persons in your workplace:

- z **Make sure exits and fire escapes are adequate**
 - properly marked;
 - accessible.
- z **Plan and drill for evacuation**
 - removal of all persons (including the handicapped, and those in special areas, e.g., washrooms);
 - ensuring that all persons (including visitors) are accounted for; this includes prompt access to daily attendance record;
 - use of alternative exits;
 - escape from toxic gases that may be generated during the fire.
- z **Provide temporary refuge for those unable to evacuate**
- z **Plan and drill for rescue operations**
 - availability of equipment;
 - first aid.

Appendix 4

Fire Protection Checklist

Inspection Date _____

Conducted By _____

Department _____

Assessed Areas	Comments & Observations
<p>Workplace Assessment</p> <ul style="list-style-type: none">z Work Processes<ul style="list-style-type: none">- all possible sources of ignition identified?- etc.z Building Construction<ul style="list-style-type: none">- all wiring properly installed and of approved construction without extensions or temporary wiring?- etc.z Building Contents	
<p>Controls</p> <ul style="list-style-type: none">z Engineering<ul style="list-style-type: none">- ventilation systems implemented and working properly?- etc.z Work Practices<ul style="list-style-type: none">- rubbish removed daily or more frequently?- aisles and floors free of oil and other flammable spills?- etc.z Administrative Controls	
<p>Emergency Plan</p> <ul style="list-style-type: none">z Communications<ul style="list-style-type: none">- emergency phone numbers readily accessible?- etc.z Safety of People<ul style="list-style-type: none">- all employees trained and tested in evacuation procedures?- etc.z Fire Extinguishment<ul style="list-style-type: none">- fire extinguishers tested?- etc.	

For Further information

To help you design your fire protection program, and particularly in carrying out your workplace assessment, consult the following:

- z Fire Protection Handbook, 15th edition.
- z Industrial Fire Hazards Handbook, 1st edition.
- z Suppliers' Materials Safety Data Sheets for the hazardous materials used in your workplace.
- z IAPA's Chemical Control Program Guide.

The first two publications are available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts, USA 02269.

Fire Protection is one in a series of guidelines to help you make your workplace safer and healthier. Other guidelines in this series on **Fire Safety** are:

- z Fire Extinguishers
- z Industrial Fire Brigades
- z Static Electricity

For more information about these guidelines or to order, call 1 (800) 406-IAPA (4272).

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