GUIDANCE FOR
IMPROVING HEALTH & SAFETY
IN THE FIRE SERVICE

Guidance material prepared by:

The Ontario Fire Service Health and Safety
Advisory Committee

Under Section 21 of
The Occupational Health and Safety Act
FORWARD

This Guidance has been prepared to assist persons, such as employers, supervisors, workers, health and safety representatives, members of Joint Health and Safety Committees, and others who have duties under the *Occupational Health and Safety Act* (OHSA) and its regulations. It should not be taken to be a statement of the law or what is necessary to comply with the law. A person with legal duties may or may not agree with this Guidance and there is no legal requirement to follow it. It is for each such person to decide what is necessary to comply with the OHSA and its regulations.

A person who needs assistance in determining what constitutes compliance should consult with his or her legal advisor. Ministry inspectors will assess workplace situations against the relevant provisions in the OHSA and its regulations but they do not enforce the Guidance, although they may refer to it in determining whether the relevant laws have been complied with.
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  Fire Vehicle Apparatus: Overloading and Improper Weight Distribution
  Fire Apparatus Aerial Ladder’s Anchoring Bed Mechanism Metal Fatigue
  Vehicle Mounted Aerial Devices

Appendix F: Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008
Preventing and Assessing Occupational Exposures to Selected Communicable Diseases: An Information Manual for Designated Officers, 1994
Post-exposure Prophylaxis (PEP) for Human Immunodeficiency Virus (HIV), 1999

MISCELLANEOUS
  Ministry of Labour Health & Safety Contact Centre
  Section 21 Blank Comment Form

Websites:
  http://www.oafc.on.ca/
  http://www.opffa.org/
  http://www.ffao.on.ca/
  http://www.ofm.gov.on.ca/
  http://pshsa.ca/emergency-services

ACTS AND REGULATIONS

Websites:
  Ontario Statutes, Regulations, and Bills
  http://www.e-laws.gov.on.ca/

  Occupational Health and Safety Act
  http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm

  Firefighters - Protective Equipment Regulation 714/94
Dear Guidance Manual Holder:

The original manual was produced in July 1991.

Future updates will be distributed as the Section 21 Advisory Committee approves them.

If you have any questions regarding the manual, call Provincial Specialist Joe O’Grady, Acting Facilitator at (416) 326-8542 (Toronto) (905) 577-1295 (Hamilton). The manual is on www.oafc.on.ca.

If you have any questions regarding the content of this manual please contact a member of the committee, or Joe O’Grady at (905) 577-1295, or e-mail him at Joe.O'Grady@ontario.ca

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INTRODUCTION

PURPOSE OF THE GUIDANCE MANUAL

The purpose of this guidance manual is to outline recommended equipment, work practices and procedures applicable to the prevention of injury or illness to workers in the fire service.

This manual complies with the intent and provisions outlined in the *Occupational Health and Safety Act* (the Act). The employer, under the OHSA, shall instruct and acquaint a worker with any hazards, and maintain equipment in good condition. {Refer to S25(1) & (2)}.

Guidance materials contained herein have been reviewed by the management and labour representatives on the Fire Service Section 21 Committee to ensure that appropriate information is made available to the fire service, to allow them to assess their equipment and procedures against recommended practice.

Several principles were observed in the preparation of this manual. A review of these may prove useful in better understanding how this manual may be used for the benefit of workers:

- To use a standard “information type” format, to provide a concise, easy to understand message to readers.
- To provide guidance rather than policy direction (e.g. manual to use terminology such as *may* or *should*).
- To encourage feedback from users regarding alternate approaches to controlling hazards.
- To develop and/or review approximately six draft guidelines per year.
- To stay away from Standard Operating Procedures, because they are developed for the specific equipment and circumstances of each department.
- To establish a mailing list of interested parties, who should receive updates.
- To use a durable, loose-leaf binder format to allow easy updating of information
- To encourage the use of association websites for information.
TERMS OF REFERENCE

Ontario Fire Service Advisory Committee
On Occupational Health & Safety
Under Section 21 of the
Occupational Health & Safety Act

OBJECTIVE

To advise and make recommendations on matters relating to the occupational health and safety of all firefighters in the Province of Ontario.

Secondary Objectives:

- To develop a Manual of Health and Safety Guidance Notes for fire services in Ontario. This manual will outline recommended equipment and procedures to be used by workers in the fire service to prevent injury or illness, and will comply with the intent and provisions outlined in the Act.
- To ensure, as far as is possible, that the guidance is applicable and acceptable to both employers and workers in Ontario, and results in improved information being available to the fire service, to assess equipment and procedures against recommended practice.

MEMBERSHIP

The committee will be composed of an equal number of representatives from management and labour, as outlined below. The committee will be co-chaired by representatives selected from each side, with secretariat being provided by the Ministry of Labour.
INTRODUCTION

For labour:

- Ontario Professional Fire Fighters Association 4
- Fire Fighters’ Association of Ontario 2

For management:

- Ontario Association of Fire Chiefs 4
- Association of Municipalities of Ontario 2

PROCESS

- Decision will be by consensus of the members in attendance, rather than by voting.
- Matters for which no consensus can be achieved will be fully reported, with explanation to the Ministry of Labour through the Director, Industrial Health and Safety Program.
- The Ministry of Labour and Ministry of Public Safety and Security will provide technical support.
- Non-members may attend committee meetings at the call of the co-chairmen and with the agreement of the committee.
- Committee members, alternates who attend on behalf of members, as well as members of task forces and/or technical committees, will be paid reasonable expenses in accordance with the Management Board of Cabinet Guidelines (S 4-1 and S6-1, respectively).
- Alternates will attend on behalf of committee members, only when it is impossible for the regular member to attend.
- Agendas will include matters that impact on the health and safety of all fire fighters in the Province of Ontario. Matters for inclusion on the agenda will be submitted to the co-chairmen one month before a scheduled meeting of the committee. Either co-chairman may include matters on the agenda. The Director of the Industrial Program of the Ministry of Labour may include matters on the agenda.
- A steering committee shall be established, consisting of the co-chairmen and the Director of the Industrial Health and Safety Program (IHSP). A chairman will be selected from within this group. The purpose of this committee will be to ensure the proper administration of functions of the Joint Advisory Committee, including setting of agendas.
• Meetings by the Section 21 Committee will be on a quarterly basis.
• The Section 21 Committee shall appoint a task force, and/or technical committee, by way of consensus.

DEFINITION OF CONSENSUS

Substantial agreement reached by the members of the committee in attendance; consensus includes an attempt to resolve all objections; it implies much more than the concept of a simple majority, but not necessarily unanimity.

ALTERNATES

One alternate will be seated and will be allowed to participate in committee discussions, if any of the represented organizations does not have a single representative present for a scheduled Section 21 Committee meeting, the following procedure will take place:

• The Co-Chairs shall be contacted and advised of the reasons for an alternate being required.
• Approved alternates will have their expenses picked-up as is customary by the MOL.

OBSERVERS

Each organization is allowed no more than one observer per scheduled Section 21 meeting. More may be allowed in special circumstances, if approved by the Co-Chairs. Co-Chairs should be advised in advance, so that seating arrangements are adequate. Observers will not take part in decision-making, and the MOL will not be responsible for expenses. Permission to address an issue must be sought and approved by the Chair of the meeting.
ACTIVITIES OF THE COMMITTEE

The Ontario Fire Service Health and Safety Advisory Committee was established February 6, 1989, to deal with health and safety issues as they arise in the fire service sector.

Earlier versions of this committee have served this purpose since 1980.

This bipartite committee's agendas are set at a meeting between co-chairs and the MOL, one month before a scheduled meeting. Other MOL observers/advisors attend as necessary.

The committee's mission is to:

- Reduce risk of injury, death, and illness in the fire service.
- Foster the Internal Responsibility System (IRS).
- Promote consistent compliance with the Act, in fire services in Ontario.
- Provide advice to the Minister of Labour regarding enforcement, regulations, policy, etc., for the fire service.
- Resolve health and safety issues that arise in the fire service.

Task Groups are established from time-to-time, to perform specific tasks. One such task group developed this guidance manual.

Members are encouraged to conduct their own investigations/research and obtain advice from appropriate parties, as deemed necessary.

Some of the issues that the Section 21 Committee has successfully dealt with in the past include: application and wording of the protective equipment regulation for fire fighters; certification and testing of protective clothing; vehicle requirements; hiring of fire service special projects officer; and heat stress.

If you have any questions, please call Provincial Specialist Joe O'Grady at 905-577-1295.
MOL ACTIVITIES

The role of the Ministry of Labour is to set, communicate, and enforce standards to protect the health and safety of workers in Ontario.

A Ministry of Labour Occupational Health and Safety Inspector’s primary role is to administer and enforce the *Occupational Health and Safety Act* and the regulations made under it in a professional and courteous manner. This is accomplished through:

- Inspection of workplaces such as fire stations, emergency scenes, and other work sites;
- Investigation of fatalities, critical injuries, complaints, etc;
- Enforcement, by issuing compliance and stop-work orders and, where appropriate, by prosecution.

Technical, medical and legal advice, policies, and guidance material such as this manual, are used to guide and assist inspectors in carrying out compliance activities.

The Industrial Health and Safety Program, under the *Occupational Health and Safety Act* (excluding construction and mining) include some 4.5 million workers in more than 246,000 workplaces. These workplaces are divided into 29 sectors: Agriculture; automotive; ceramics, glass & stone; chemical & plastics; construction premises; education; electrical & electronics; film & TV; fire; fishing; food, beverage & tobacco; government; health care; industrial services; live performance; logging and sawmills; office & related services; police; primary metals; pulp & paper; restaurants; retail; textiles & printing; tourism, hospitality & recreational services; transportation; utilities; vehicle sales & service; wholesalers; wood & metal fabrication.

A number of Ministry of Labour Occupational Health and Safety Inspectors have received special training to deal with health and safety in the fire sector. These inspectors inspect the fire services as part of their other inspection duties.
HEALTH & SAFETY ORGANIZATIONS/RESOURCES

The following organizations may be contacted as a resource on occupational health and safety:

**Workplace Safety and Insurance Board (WSIB) –** [www.wsib.on.ca](http://www.wsib.on.ca)
200 Front Street West
Toronto, ON. M5V 3J1
Tel: 416-344-1000
Toll Free: 1-800-387-5540

The WSIB was established in 1998 to administer workers’ compensation, the Certified Member Program and the Young Workers Awareness Program, to provide financial incentives to decrease workplace injuries, and to oversee the Safe Workplace Associations.

**Workers’ Health and Safety Centre (WHSC) –** [www.whsc.on.ca](http://www.whsc.on.ca)
15 Gervais Drive, Suite 102
Don Mills, ON M3C 1Y8
Tel: 416-441-1939

The WHSC was established by the Ontario Federation of Labour in 1979. Since that time, the Centre has become a major source of health and safety training to workers in Ontario. Their operations are overseen by an independent Board of Directors from unions and other organizations representing workers in virtually every sector of the economy. They operate from five regional offices located all across Ontario.

Their purpose is to promote workplace prevention measures that reduce occupational disease, disability and death, and to equip and encourage workers to promote the well being of other workers, and improve the health and safety environment within their workplaces. They are committed to quality health and safety training for workers, delivered by their peers.
The WHSC employs trained technical consultants. They are available to do an on-site analysis and work with your health and safety committee to develop a workplace health and safety plan.

Public Services Health & Safety Association (PSHSA)
4950 Yonge Street
Suite 1505
Toronto, ON M2N 6K1
Tel: 416-250-2131 / Fax: 416-250-7484
Toll free: 1-877-250-7444
communications@pshsa.ca

PSHSA works with Ontario public service sector employers and workers, offering consulting, training and resources to reduce workplace risks and prevent occupational injuries and illness.

From establishing the foundational elements of a safety program to promoting a positive safety culture in your workplace, PSHSA will help you identify risks, control hazards and make your organization a healthier and safer place to work.

PSHSA consultants are located across the province and offer a wealth of diverse expertise and specialization in a variety of areas, offer more than 100 different general and sector-specific training courses on a full range of topics and a wide variety of general and sector-specific products in a range of formats, from DVDs to posters, manuals and training kits.

There are a number of high-hazard occupations in the Emergency Services sector, including: emergency medical service workers, firefighters and police officers. Possible exposure to infectious diseases, MSDs, workplace violence and aggression, motor vehicle incidents, and the potential negative effects of shift work heighten the risk of occupational illness/injury in emergency services staff. Many of the hazards encountered in the municipal sector have specific legislative compliance requirements.

PSHSA offers guidance, assistance, consulting and training to help address these issues and reduce incidences of injury in your workplace. Whether your organization has an established health and safety program, or you are just beginning your health and safety journey, our consultants have the knowledge, solutions and expertise to help you identify risks, control hazards and ensure that you have the necessary tools to meet legislative requirements.
From establishing the foundational elements of a safety program to promoting a positive safety culture in your organization, PSHSA helps to make your organization a healthier and safer place to work.

Canadian Centre for Occupational Health & Safety (CCOHS) – www.ccohs.ca
250 Main Street East
Hamilton, ON L8N 1H6
Tel: 1-800-668-4284 (toll free in Canada and USA)
1-905-570-8094 / Fax: 1-905-572-2206

The CCOHS was created by Act of Parliament in 1978 “to promote the fundamental right of Canadians to a health and safe working environment”. It is Canada’s national centre for occupational health and safety (OH&S) information. They have a well-established reputation worldwide, as an innovative, expert OH&S resource. As a corporation governed by a council with representatives from employers, labour and government, CCOHS is committed to providing impartial, accurate, useful information to all parties in the workplace.

Their mandate is to promote health and safety in the workplace, and encourage attitudes and methods, which will lead to improved physical and mental health of working people. Our products and services, designed with an emphasis on prevention, foster improvements in the workplace.

Their clients include: managers, supervisors, workers, government officials, OH&S specialists, health care professionals, lawyers, and representatives from unions and community and educational groups.

The CCOHS professional staff provides up-to-date health and safety information through a variety of products and services, including an inquiries service which responds directly to the occupational health and safety needs of Canadians, publications geared to the workplace, and electronic products such as CCINFO disc, a series of over 20 CD-ROMs that contain databases, publications, full text Canadian safety and environmental legislation, and multimedia training packages.
Their products are designed in cooperation with national and international OH&S organizations, agencies and associations.

The service is provided in both official languages to individuals and organizations. The identity of the inquirer is kept confidential.

Occupational Health and Safety Resource Centres
Locations (see below)

Five “Occupational Health and Safety Resource Centres of Ontario” provide information and training in occupational health and safety. These centres are very active in providing services to assist industry, labour, small business and other educational institutions.

Centres are located at Cambrian College in Sudbury, Lakehead University in Thunder Bay, Queen’s University in Kingston, University of Waterloo in Waterloo, and University of Western Ontario in London. Each centre serves the needs of a specific area.

Other Resources (websites)

Ontario Ministry of Labour: http://www.labour.gov.on.ca/english/
Infrastructure Health and Safety Association: http://www.ihsa.ca/
Ontario Association of Fire Chiefs: http://www.oafc.on.ca/home.asp
Ontario Professional Fire Fighters Association: www.opffa.org
Fire Fighters’ Association of Ontario: http://www.ffao.on.ca/
Public Services Health and Safety Association: http://pshsa.ca/
National Fire Prevention Association: www.nfpa.org
The Canadian Red Cross Society – www.redcross.ca
5700 Cancross Court
Mississauga, ON L5R 3E9
Tel: 905-890-1000

The Canadian Red Cross Society is a volunteer-based organization, providing
emergency relief and humanitarian services to the public in accordance with seven
fundamental principles: humanity, impartiality, neutrality, independence, voluntary
service, unity, and universality.

Health and social service initiatives include: courses in water safety, first aid and cardio-
pulmonary resuscitation; means on wheels, and the loam of assistive devices and
sickroom equipment for persons recuperating at home.

All emergency and humanitarian relief services continue to operate in times of disaster
or conflict, in Canada and around the world.

St. John’s Ambulance – www.sja.ca
5700 Cancross Court
Mississauga, ON L5R 3E9
Tel: 905-890-1000

St. John’s ambulance is a world-renowned, non-profit organization whose goal is to
provide quality first-aid, CPR, and health care training and service, to help Canadians
reduce accidents, maintain health and minimize the consequences of injury and illness.

The “Emergency First Aid” and “Standard First Aid” courses are provided to industry in a
modular form that allows inclusion of upgraded material such as CPR training.
Advanced and instructor levels courses are also available. Certificates are provided
upon successful completion of each course. A computer-based first-aid training course
is available.

St. John’s ambulance is the oldest and one of the largest charitable organizations in the
world.
INTRODUCTION

INTERNAL RESPONSIBILITY SYSTEM (IRS)
(OR ROLES/RESPONSIBILITY/ACCOUNTABILITY)

The Act is based on the concept of co-operative compliance, a system that assigns roles and responsibilities to a group that has direct responsibility for workplace health and safety, and to a group that has a contributory responsibility in health and safety. The direct responsibility to control occupational risks rests with the employer, the supervisor, and the worker. This system is known as the Internal Responsibility System (IRS).

It requires the participation of the employer and worker to develop systems and procedures suited to the particular circumstances of each workplace. For the parties in the workplace, such participation is likely to result in a greater understanding of the risks affecting the worker, acceptance of each party’s responsibility for worker safety, improved communications and a deeper commitment to reducing and controlling occupational health and safety risks. Although the IRS is not specified or defined in the Act, it forms the basis of the Act.

During an inquiry into workers’ health and safety in the pulp and paper sector, Dr. Ham suggested that anyone who views health and safety solely in terms of unsafe acts and unsafe conditions, is operating based on an over simplified model. Just a few other factors to consider include: raining, supervision, age, sex, abilities, technology, materials used, character of management, and attitudes.

According to Dr. Ham, people are now demanding their rights to a greater degree than ever before. However, we need to balance rights with accompanying responsibilities.

The IRS involves everyone, from the top of an organization, down to the worker. Its effectiveness depends on assignment of responsibilities, their execution and accountability. Senior management attitudes, relationships between management and labour, community interests, technology, and process, all interplay to determine how safety is viewed in the workplace.

While regulatory bodies exist to audit the IRS and to make judgements as to whether conditions are tolerable, there needs to be a balance between formal regulations and self-compliance. Studies on accident statistics in California show that about 50% of accidents are not associated with a breach of regulations. It is impracticable to attempt to regulate everything. External audits must serve to keep the IRS alert. Fines and
prosecutions are useful, in that they elicit attention and raise concerns about a company’s public image.

Other factors requiring more attention include: competency of supervision, training, injury record keeping, certification of equipment, health regulations, and participation of affected parties in setting regulations. Dr. Ham noted that “near misses” are symptoms of a faulty IRS. Incidents such as these lead to more serious accidents.

If Dr. Ham were to make one change to the legislation, it would be to make senior management more responsible for the health and safety performance of their organization. How often does a senior manager review health and safety? Does the Annual Report note safety performance? Most important, discussion must centre more on responsibilities, rather than rights. All too often, the responsibility for worker safety is pushed all the way down to the bottom of the organization. Accidents are blamed on first-line supervisors and, thus, senior management avoids any responsibility.

Probably the most common misconception regarding IRS, according to Dr. Ham, is that the JHSC personifies IRS. In fact, the JHSC is only a very small part of IRS. IRS is better defined as the top to bottom “fabric” of responsibility regarding health and safety.

Management has a choice. They can demand and reward good safety performance or they can delegate their responsibility. Workplaces with exceptional safety programs demand and receive good safety performance. A clear line of responsibility must be established for correcting health and safety concerns at the workplace. Once this is established, working relationships between management and labour will be enhanced. Unsafe conditions can be eliminated only if identified and reported to the appropriate level of supervision. Corrective action must be of high priority. This means that adequate funds and manpower need to be allocated.
SUCCESSFUL HEALTH AND SAFETY EFFORTS

Two basic principles must be present in order to achieve a high standard of health and safety: a) a demonstrated commitment from the top down; and b) the involvement of the workers in the workplace. Commitment to health and safety must be demonstrated daily.

CHECKLIST FOR SUCCESS

Top management commitment to health and safety:

- Corporate Policy Statement [ ]
- Budget provided for health and safety [ ]
- Safety performance discussed in the corporate boardroom [ ]
- Safety record in Annual Report [ ]

Direct responsibility from top to bottom of organization [ ]

Open & supportive atmosphere [ ]

Good labour/management relationship regarding health and safety [ ]

Strong training programs established [ ]

Assess hazards and training requirements for new technology before introducing into workplace [ ]

Prompt response by management to Joint Health and Safety Committee Recommendations [ ]

JHSC minutes and accident investigated by worker and management representatives [ ]

Work complaints investigated seriously [ ]
TABLE OUTLINING RESPONSIBILITY/ACCOUNTABILITY FOR SAFETY/WORK PERFORMANCE

In June 1976, James Ham submitted the "Report of the Royal Commission on the Health and Safety of Workers in Mines." This report, more commonly known as the Ham Report, contained a table entitled "internal responsibility system for tile performance of work" (table 51). A simplified version of this table has been developed for use in the pulp and paper industry as outlined below.

<table>
<thead>
<tr>
<th>Responsibilities</th>
<th>Workers</th>
<th>Supervisors</th>
<th>Managers</th>
<th>President, C.E.O. &amp; Board of Directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of task</td>
<td>Perform task</td>
<td>Schedule and assign work task</td>
<td>Set objectives and work plan</td>
<td>Establish purpose and overall goals</td>
</tr>
<tr>
<td>Responsibility for workers</td>
<td>Direct helpers. Keep alert for coworkers, particularly new hires</td>
<td>Select, instruct and supervise workers</td>
<td>Select and develop supervisors</td>
<td>Select plant manager</td>
</tr>
<tr>
<td>Responsibility for safe performance of work tasks</td>
<td>Use training, knowledge, and skill to safely accomplish tasks according to accepted practices and procedures. Report unsafe or other conditions that reduce performance.</td>
<td>Direct workers to follow safe and efficient operating procedures according to job descriptions, health and safety legislation, policies and procedures.</td>
<td>Ensure that procedures are developed to comply with operating philosophy and policy.</td>
<td>Establish business philosophy regarding efficient and safe use of human resources.</td>
</tr>
<tr>
<td>Responsibility for facilities and equipment</td>
<td>Use facilities, equipment, machines, and tools. Do not use unsafe equipment</td>
<td>Provide adequate tools, services, and equipment. Provide adequate maintenance.</td>
<td>Provide adequate operating capital and facilities.</td>
<td>Authorize expenditures</td>
</tr>
<tr>
<td>Responsibility for safe and efficient work conditions</td>
<td>Maintain standardized work conditions</td>
<td>Implement and monitor acceptable level of standardized safe work conditions</td>
<td>Determine acceptable level of standardized safe work conditions, set out in writing, and institute as part of performance appraisal system.</td>
<td>Set overall policy regarding safety and efficient work conditions. Monitor accident statistics and budget</td>
</tr>
<tr>
<td>Responsibility for reporting of substandard conditions</td>
<td>Inspect work site and equipment as regular part of doing task. Report substandard and unusual conditions to supervisor.</td>
<td>Inspect work area as regular part of directing work tasks, investigate reports of unusual and substandard conditions. Take action to correct. Where corrective action will take some time, provide interim protection or solution. Report to plant manager, as necessary to correct conditions.</td>
<td>Develop an effective accountability and audit system. Report on business and safety status to C.E.O.</td>
<td>Report to owners on status of company.</td>
</tr>
</tbody>
</table>
ENFORCEMENT OF FIRE FIGHTERS GUIDANCE NOTES

Ministry of Labour inspectors refer to guidelines, guidance notes, alerts, etc. when they carry out their enforcement duties under the Occupational Health and Safety Act and Regulations. They are considered in determining if reasonable precautions for the protection of a worker are being taken under clause 25(2)(h) of the Act. Inspectors may reference these Guidance Notes in the narrative of their field visit reports.

Fire departments should, in consultation with their Joint Health and Safety Committee or Health and Safety Representative, incorporate into their standard operating procedures/guidelines (SOPs/OGs) or policy and operational guidelines (OGs) the principles set out in the guidance notes developed by the Ontario Fire Service Section 21 Advisory Committee and distributed by the Ministry of Labour. SOPs/OGs should take into account the fire department's response capabilities. Firefighters should be trained using their own department's operational guidelines.

The materials in the manual are published and placed on fire service websites after considerable input has been received from the affected parties.

These guidelines quickly have become the accepted practice for fire fighter protection in Ontario.

Note that in volunteer departments, without a joint health and safety committee, a worker representative should receive a copy of this manual. The manual is available via the Ontario Association of Fire Chiefs website and may be hyperlinked to: http://www.oafc.on.ca/news/news.asp?itemcode=OAFC-SEC21-MANUAL.

The employer is responsible for the distribution of the material in the manual in accordance to section 25(2)(a) under the Occupational Health and Safety Act. Anyone who does not have access to the Section 21 Health and Safety Manual should contact Joe O'Grady, Acting Section 21 Facilitator, Ministry of Labour, at (416) 326-8542 (Toronto) (905) 577-1295 (Hamilton).
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FIRE FIGHTERS GUIDANCE NOTE #1-1

ISSUE: FIRE TRUCK OCCUPANT SAFETY
(previously known as DRESSING ON FIRE TRUCKS)

Collisions involving fire apparatus are a major cause of injury and death to firefighters.

Activities that require any occupant to leave their seated and belted position while riding on a moving vehicle, such as dressing in protective clothing, may result in serious injuries or death should the vehicle make a sudden stop or collide with other vehicles or stationary objects.

It is a good health and safety practice for apparatus occupants to remain seated, with the provided seat belt properly attached, until such time as the apparatus comes to a complete stop at the final destination.

There is an exemption in Regulation 613 (Seat Belt Assemblies) made under the Highway Traffic Act that states that a “firefighter occupying a seating position behind the driver’s cab in a fire department vehicle…..is exempt” from wearing a seat belt “where the performance of work activities make it impracticable to wear a seat belt assembly”. However, the Section 21 Committee recommends as a good health and safety practice for seat belts to be worn while the vehicle is in motion. Employers would have to determine which work activities, if any, would exempt firefighters from wearing a seat belt.

Where firefighters are assisting Emergency Medical Services personnel in an ambulance attending to a patient, as stated above, the Section 21 Committee recommends as a good health and safety practice for seat belts to be worn while the vehicle is in motion. Employers would have to determine which work activities, if any, would exempt firefighters from wearing a seat belt.

In the event that an emergency incident is received when the fire truck is returning from an emergency or other duties that require the occupants to remove their seat belt and/or stand up to don bunker gear prior to responding, the vehicle should be safely pulled over to the side of the road and stopped to allow for the donning of the required protective equipment. Thereafter, it is a good health and safety practice for firefighters to return to their respective seats and fasten their seat belts prior to continuing to the emergency response.
It is equally important that all items in the cab of every fire apparatus are positively restrained and secured at all times. Any item that is not properly secured and restrained will become a projectile in the event of a collision involving the fire truck. Fire departments should relocate any non-essential equipment out of the cab of fire trucks whenever possible.

Unrestrained SCBA can cause serious injury to vehicle occupants when the truck is involved in a collision. As required in Section 7 (4) of O. Reg. 714/94 (Firefighters - Protective Equipment), tools, self-contained breathing apparatus and other fire fighting equipment or paraphernalia carried in the cab of the fire truck shall be secured to fixed positions by positive mechanical means or stowed in compartments with positive latching doors.

All seat-mounted SCBA should remain restrained at all times in accordance with manufacturers’ instructions when the vehicle is in motion. At no time should the cylinder restraint device be released until such time as the apparatus has come to a complete stop at the final destination.
FIRE FIGHTERS GUIDANCE NOTE # 1-2

ISSUE: VEHICLE INSPECTIONS & MAINTENANCE PROGRAM

Annual Commercial Vehicle Inspections

All fire apparatus with a gross weight, registered gross weight or manufacturers gross vehicle weight rating exceeding 4500 kilograms must be inspected on an annual basis (in accordance with O. Reg. 611 Safety Inspections, made under the Highway Traffic Act). These vehicles are required to display an inspection sticker as evidence of compliance with this requirement.

Inspections must be conducted at a Motor Vehicle Inspection Station licensed by the Ministry of Transportation. Fire departments or municipalities may apply to be licensed to conduct inspections themselves if they have a certified mechanic, appropriate tools and a suitable shop facility.

For more information on the Motor Vehicle Inspection Program contact your local Ministry of Transportation Enforcement Office.

Driver Inspections

A “commercial motor vehicle” for the purpose of Section 107 of the Highway Traffic Act and O. Reg. 199/07 Commercial Motor Vehicle Inspections (made under the Highway Traffic Act) does not include fire apparatus. As such, the daily inspection requirements do not apply to fire department vehicles. Despite this exemption, it is recommended as a good health and safety practice for fire departments to train firefighters on conducting driver inspections and to establish procedures for the inspections to be conducted on all fire apparatus.

Vehicle inspections should be completed at either the beginning of each shift or thereafter as soon as reasonably possible if disrupted to respond to an emergency call. If it is not possible to inspect a vehicle prior to an emergency call, a post emergency call vehicle inspection should be conducted. Vehicle inspections should be accurately documented. Further, firefighters should continually monitor the vehicle during the course of the work shift to detect the presence of any major or minor defects.

Vehicle Preventative Maintenance Program

In addition to the annual inspections, fire departments should develop a preventative maintenance program inspecting the vehicles at a regular interval to ensure the vehicle is safe and will not jeopardize the safety of other road users or the occupants of the apparatus. A
record of these inspections including the date, odometer reading and the nature of inspection and any subsequent repairs should be kept by the department.

At the time of licensing, vehicles should be weighed to ensure safe overall weight and weight distribution. Fire departments should consider the impact of equipment redistribution that may affect overall balance/weight of the vehicle.
FIRE FIGHTERS GUIDANCE NOTE #1-3

ISSUE: BACKING FIRE APPARATUS

The following guidelines are for backing fire apparatus into Stations and for backing up required during the performance of fire fighting duties at emergency scene. This guidance note does not apply to traffic control that may be necessary for the protection of firefighters working at an emergency scene. It is recognized that under certain circumstances firefighters are required to request vehicles to stop, to either get fire apparatus back into a station or move an apparatus at an emergency scene. However, firefighters must not attempt to stop traffic unless it is absolutely necessary and essential to getting a vehicle back into service, or traffic conditions warrant this action.

When backing into a fire station is required, the following items are recommended:

It is recommended that the vehicle come to a full stop in front of the Station with the headlights, beacon ray and 4-way flashers turned on. This allows firefighters to dismount safely and assist the driver while backing up.

Firefighters posted on either side of the vehicle but not on the roadway, should assist the driver in determining when it is safe to pull onto the road. Flashlights can be used when visibility is poor. The duty of firefighters assisting in backing up is to control pedestrian traffic and by using agreed upon hand signals to assist the driver to back the vehicle onto the ramp and into the station. In some locations it may be necessary for firefighters to temporarily control the flow of traffic for their own protection. In these situations, ensure that the firefighters are in a safe position.

Important: To ensure the safety of firefighters, they must stay in full view of the apparatus operator while guiding the apparatus.

Where there are insufficient members of a vehicle crew available to assist the driver to back into a station and firefighters are on duty with a station, they should be summoned to provide the necessary assistance. Priority must be given to the safety of citizens and firefighters in any backing-up operation.
When backing, other than into a fire station, is required, the following additional items are recommended:

Avoid backing-up whenever possible. Plan ahead when parking, so backing-up is not necessary.

Where backing-up is unavoidable, use firefighters who move with the vehicle, and use the vehicle as shielding as much as possible.

Where firefighters are unavailable, drivers should dismount and walk completely around the vehicle, before backing-up, to ensure there are no unseen obstacles behind the apparatus.

Backing of Tankers during water shuttle operations is often unavoidable and must be done as carefully as possible to avoid accidents and injury. Consider the following:

- When possible, dump chutes should be positioned for dumping prior to the final backing to the Port-a-tank.

- Remote control of the dump valve from the side of the truck or from the cab should be considered so firefighters do not have to operate from the back of the vehicle.

- A Water Supply Officer (WSO) should be assigned to control the movement of tankers and keep firefighters clear of tankers when backing up.

- High visibility traffic vests should be use by firefighters assigned to direct tankers and/or operate filling or dumping operations.
FIRE FIGHTERS GUIDANCE NOTE #1-4

ISSUE: ENCLOSED CABS FOR FIRE TRUCKS

The Section 21 Committee wishes to clarify the requirements of Sections 7 and 8 of Regulation 714/94.

The intent of the Regulation 714/94, Section 7 enclosed cabs, is:

- After December 15, 1995, any new or used fire truck purchased by a fire department in the Province of Ontario is required to have an enclosed cab meeting the requirements of Section 7 before it could be put into service.

- Fire apparatus in service as of December 15, 1995, do not require any special modification or retrofit as long as they remain with the original purchasing fire department. If a jump-seat equipped fire apparatus was sold to another fire department, the need for retrofit would have to be assessed in application to Section 7.

Fire Departments should purchase new or used apparatus with enclosed cabs meeting the requirements of Section 7 of regulation 714/94.
FIRE FIGHTERS GUIDANCE NOTE # 1-5

ISSUE: LIFE SAFETY ROPE AND EQUIPMENT

Fire departments that use life safety ropes / equipment should establish and maintain a comprehensive life safety rope / equipment inspection, retirement, replacement and record keeping program.

Record keeping should include a complete history of all life safety ropes and related equipment.

Manufacturers of life safety rope are required to provide information for the fire department to consider prior to reusing life safety rope. Manufacturer's directions should be followed when inspecting, testing and maintaining all life safety ropes and related equipment.

At a minimum, the following criteria should be met before reusing life safety rope:

- Rope has not been visually damaged;
- Rope has not been exposed to heat, direct flame impingement, or abrasion;
- Rope has not been subjected to any impact load;
- Rope has not been exposed to liquids, solids, gases, mists, or vapors of any chemical or other material that can deteriorate rope;
- Rope passes inspection when inspected by a qualified person following the manufacturer's inspection procedures both before and after each use.

If any life safety rope does not meet all of the above conditions, it should be immediately removed from service as a life safety rope. If there is any doubt about serviceability of a rope, remove it from service and do not use it for life safety activities.

Fire departments should establish life safety rope / equipment retirement policies in accordance with manufacturer's service life recommendations.

When acquiring new life safety ropes or related equipment, fire departments should ensure that the equipment has been properly tested and certified for life safety purposes by a qualified agency. Examples of suitable standards include:

FIRE FIGHTERS GUIDANCE NOTE #1-6

ISSUE: INSPECTION OF CHAINS AND EXTRICATION TOOLS

Spreaders, cutters, ram, etc. and chains are all an integral part of extrication tools. This equipment needs to be kept clean and in good working order for the safety of emergency workers.

If a chain or extrication tool breaks during a rescue the results can be catastrophic to both the rescuer and the person being rescued.

Regular checks should be made to ensure that tools and chains are stored to ensure:
- They are free of rust and/or oxidation
- They are clean and properly lubricated

Note: Chains should be hung whenever possible.

After each use tools and chains should be cleaned and inspected for:
- Excessive wear at pressure points
- Nicks or gouges
- Elongation, distortion of or damage to links, couplings or attachments
- Twists in chains
- Spread at throat openings of hooks on chains

Note: Spread at throat openings of hooks on chains should be measured against measurements taken at time of purchase or manufacturer’s specifications.

When using chains:
- Use pads around sharp edges
- Look for stretching of the chain or hook while using equipment. If detected, stop use immediately because the chain is exceeding its load limit.
- Do not expose to high heat because Chains can loose considerable strength when subjected to excessive heat. For example:
  a) 400 degrees F reduces the working load by 10%
  b) 600 degrees F reduces the working load by 30%
Extrication tools, including chains should be inspected by a competent person using non-destructive test methods, if the following conditions are detected by routine inspection or use:

- Signs of wear, elongation, distortion or excessive heat
- Tools or chains have been subjected to severe blows or impact loading.
FIRE FIGHTERS GUIDANCE NOTE #1-7

ISSUE: ELECTRICAL EQUIPMENT AND CORDS

The Ontario Fire Service must work with electrical generators, tools, and cords. The majority of incidents (shocks, burns, electrocution) have occurred from improperly maintained tools and electrical cords. This Guidance Note, along with your department's own SOP/OG, will aid your department to help eliminate this problem.

Tools, lights and cords should be repaired and maintained to manufacturer’s specifications.

Electrical cords with breaks, splits, cuts, and cracks in casing, should be repaired or removed from service.

- Electrical cords with damage to inner casings or wire should be replaced.
- Tools, lights, and cords should be cleaned and inspected after use.
- Portable electrical lights should have a protective screen over bulb/glass area.
- New electrical cords should have dust and moisture resistant male/female ends.
- Cords or devices that have multiple male/female connections should be repaired with dust/moisture free ends or replaced with new cords or devices if one fails.
- Only three wire or double insulated tools, equipment or cords should be used.
The following chart can be referenced for proper cord size for job and distance:

**RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS** *

<table>
<thead>
<tr>
<th>Length Amperes</th>
<th>25’</th>
<th>50’</th>
<th>75’</th>
<th>100’</th>
<th>150’</th>
<th>200’</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 5.0</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>14</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>5.1 – 8.0</td>
<td>16</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>8.1 – 12.0</td>
<td>14</td>
<td>12</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12.1 – 15.0</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15.1 – 20.0</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
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FIRE FIGHTERS GUIDANCE NOTE # 2-1

ISSUE: INCIDENT COMMAND

Every fire department should develop and implement an Incident Command System. The most effective Incident Command System will be specific to each fire department's own resources, but based on the principles of Incident Command referenced from systems such as the:

- Phoenix Fireground Command System;
- California Incident Command System;
- Incident Management System currently being developed by the National Fire Service Incident Management System Consortium which is merging both of the above systems; and
- Incident Command as taught by the Ontario Fire College, Gravenhurst.

Successful emergency scene operations require the application of an effective overall management system and the skill development of the Officer so that they can serve as Incident Commanders.

The lack of a strong Incident Command System adversely affects the outcome of emergency scene operations and places firefighters in needless danger. Conversely an effective command system has a dramatic effect on efficiency, effectiveness of response and safety not only on the fire ground, but during hazardous materials incidents, auto accident extrications, water/ice rescues, or any other incident where personnel and apparatus need to be coordinated.

Although an Incident Command System is of greatest advantage in large or complex situations, it should be used every day during routine incidents to maintain the effectiveness of the Incident Command System and so that personnel have a chance to practice often.

The Incident Command System cannot stand alone but requires the support of operational guidelines, training, post incident analysis and constant review and revision as necessary.
The benefits of using an Incident Command System are:

- It provides a means for using limited resources effectively.
- By having one person in charge, one plan or strategy for handling the incident can be developed and implemented. This reduces loss of life and property.
- Increased firefighter’s safety by implementation of such key concepts as crew accountability, safety officers, sectoring, crew rotation, etc.
FIRE FIGHTERS GUIDANCE NOTE # 2-2

ISSUE: THE BUDDY SYSTEM

One of the oldest principles taught to firefighters is the “buddy system.” Firefighters entering a burning structure or hazardous area must employ the buddy system by entering, working and exiting in pairs.

The purpose of the buddy system is to ensure that if one firefighter becomes injured, trapped, or unconscious, the buddy will be available to assist or call for help.

Some fire department's operational procedures use an entry team of 3 to 5 firefighters with or without a company officer in charge. When operating in attack teams of this size, it is even more important that the principles of the buddy system are adhered to, because it is easier for one firefighter to go missing before someone notices. Under the team attack concept no one exits a hazardous area alone. If a situation makes it necessary for one member of the team to exit, such as a malfunctioning SCBA, the team members exit in pairs or the entire team exits.

Fire departments should develop operational guidelines that lay out entry and exit principles that suit each fire department's response capabilities. Firefighters should be trained, using their own department's operational guidelines.
FIRE FIGHTERS GUIDANCE NOTE # 2-3

ISSUE: RADIO COMMUNICATIONS

Firefighters should have a method of two way communication that provides contact with the Incident Commander and/or the assigned Sector Officer as the incident dictates. When radio communications devices are used, they should be able to be operated without removing the face piece of their self-contained breathing apparatus.

Coroner’s Jury Recommendations into fatalities of firefighters emphasize the need for effective communication devices and procedures as a critical component in emergency operations. Communications devices and procedures should be used in conjunction with entry control and incident command systems and common plain text language should be used. Fire departments should identify dead zones within their response areas and pre-plan accordingly.

In consultation with the Joint Health and Safety Committee or Health and Safety Representative, when considering new or upgrading of radio communication devices, fire departments should take into consideration the following:

- The need for intrinsically safe radio ensembles
- Ease of operation in full PPE – especially gloved hands
- Multiple frequency (talkgroup) capabilities that enable effective fireground communications, removed from unnecessary radio congestion
- Features that may safeguard against accidental shut off or accidental channel changes
- Durability (i.e. resistance from damage due to water, chemicals, temperature extremes, rough handling)
- A reliable maintenance and repair program with SOPs/OGs that cover the regular testing of all radios and radio features, including any emergency buttons or electronic radio identification codes that may exist
- The need for radio interoperability with other emergency response agencies
- In-building radio coverage and the potential need for in-building or mobile repeater solutions
- The need for hands-free radio operation
- The need for simplex (talk around) functionality on trunked radio systems.

Once radio equipment has been selected, the appropriate training is required. Training should include the use of portable radios in conjunction with full PPE.
Mayday and RIT deployment operations are known to cause significant radio communications congestion. Incident Command radio communications procedures to address these operations should be developed.

Reference:

GN # 2-1 Incident Command
GN # 5-1 Firefighter Accountability and Entry Control
GN # 6-11 Rapid Intervention Teams (Rescue)
FIRE FIGHTERS GUIDANCE NOTE # 2-4

ISSUE: INCIDENT SAFETY OFFICER

The Incident Commander (IC) is ultimately responsible for Firefighter health and safety at the fire scene. Given the complex nature of fire fighting activities, the IC should consider establishing a safety sector to assist with managing scene safety. A safety sector should be established at any incident where the Incident Commander’s span of control exceeds a safe operational level, or at incidents where there is a higher than normal risk to firefighter’s health and safety.

Any competent person (rank or no rank) who is qualified because of knowledge, training and experience may be designated the Incident Safety Officer (ISO) by the IC.

The Safety Sector is managed by the ISO, and may include assistants.

A Department’s written operational guidelines should establish:

- When a Safety Sector should be established.
- Who should be appointed ISO based on the individual department's operations and resources?
- When and under what authority the ISO can unilaterally alter, suspend or terminate dangerous or life threatening operations.
- That the presence of an on scene ISO in no way diminishes the responsibility of individual Officers and the IC for the safety of workers under their direction.
- The roles and responsibilities of an ISO.
- That any person that may be assigned to act as the ISO by the IC requires training on their responsibilities before being assigned.
- That the ISO has to be able to integrate with the communication system being used.
- That the ISO should monitor departmental SOP/OG regarding health and safety.
- How the ISO is to be identified at the scene.
FIRE FIGHTERS GUIDANCE NOTE # 2-5

ISSUE: DESIGNATED OFFICER PROGRAM FOR COMMUNICABLE DISEASE

The Communicable Disease Protocol developed by the Public Safety Services Liaison Committee was distributed under covering letter to be inserted in the Fire Service Health and Safety Information (Section 21) Binder in January 1995 (see Appendix F of this manual - “Preventing and Assessing Occupational Exposures to Selected Communicable Diseases: An Information Manual for Designated Officers”, 1994).


The Information Manual for Designated Officers, 1994, is in the process of being revised by MOHLTC; its contents, along with the 2008 Protocol, should be referenced until such time as the Information Manual for Designated Officers, 1994, is revised.

All fire departments are required to implement the Exposure of Emergency Service Workers to Infectious Diseases Protocol (2008) in their respective workplaces after consultation with the local Medical Officer of Health. The 2008 Protocol was developed to provide direction on the requirements identified in the Ontario Public Health Standards, published by the MOHLTC under the authority of the Health Protection and Promotion Act.

When selecting the Designated Office(s) under the Protocol, the Fire Service Health and Safety Advisory Committee recommend that:

- The selection of the Designated Officer(s) should be made in consultation with the workplace Joint Health and Safety Committee or Health and Safety Representative and consideration should be given to covering all shifts and the addition of alternates.

- Fire Departments should develop SOPs/OGs that outline how firefighters can contact Designated Officer(s) on nights, weekends and holidays. Exposures should be reported immediately as post exposure prophylaxis needs to be administered within a short time frame post exposure.
• Designated Officers should have some knowledge of diseases that firefighters may be exposed to and be aware of the requirements of the Mandatory Blood Testing Act, 2006. This information is of assistance when consulting with exposed persons.

• Designated Officers are to liaise with the Medical Officer of Health on procedures and protocols for reporting possible exposures.

• Supervisors should be familiar with the program and ways of notifying the Designated Officer.

Reference:

Appendix F - Preventing and Assessing Occupational Exposures to Selected Communicable Diseases: An Information Manual for Designated Officers, 1994

Appendix F - Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008
FIRE FIGHTERS GUIDANCE NOTE # 2-6

ISSUE: EMERGENCY PREPAREDNESS

The overall responsibility for municipal emergency planning is with provincial and local governments as described in the Emergency Management Act 2002.

To ensure that safety procedures for emergency workers are adequate, fire departments should regularly review the fire service responsibilities as outlined in local municipal emergency plans and focus on the following key points:

- Review internal incident command systems and operating guidelines to ensure compatibility with municipal emergency plans.
- Review municipal emergency plans to ensure that department plans are current.
- Ensure that adequate safety, rehabilitation and debriefing procedures are identified for emergency workers.
- Incorporate emergency planning into the regular fire service training Schedules.
- Provide potential emergency site managers (incident commanders) with appropriate training.
- Conduct regular, paper, tabletop and actual exercises to test and revise the plan.
- Regularly review telephone, resource lists and agreements.
- Provide an adequate post incident review process to ensure that the emergency plans are revised as required.
- Ensure that media information procedures are identified.
Departmental plans should include information on:

- Critical Incident Stress (CIS) procedures.
- Decontamination procedures.
- Equipment replacement procedures.
- Sanitation facilities.
- Medical monitoring.
- Mutual Aid.
- Role of outside agencies.
- Clean up of equipment.
FIRE FIGHTERS GUIDANCE NOTE # 2-7

ISSUE: REPORTING EXPOSURES TO BIOLOGICAL, CHEMICAL OR PHYSICAL AGENTS

Firefighters routinely work in locations where there is a potential to be exposed to different biological, chemical or physical agents. These exposures may occur, despite taking every precaution reasonable in the circumstances to protect firefighters’ health and safety.

Fire departments should, in consultation with their Joint Health and Safety Committee or Health and Safety Representative, incorporate into their SOPs/OGs the principles set out in this Guidance Note.

The WSIB does not maintain records for occupational exposures that do not result in a lost-time injury and medical aid is not sought. Firefighters may experience many such exposures over their careers that could result in an illness or disease long after the time of the exposure. A record of these exposures may help to determine if the illness or disease was caused by workplace exposures.

It is the view of the Section 21 Committee that fire department records should be maintained for all real and suspected exposures of firefighters to biological, chemical or physical agents that have the potential to result in an immediate or future occupational illness or disease. A copy of the Exposure Report should be given to the individual firefighter but the fire department/employer should maintain permanent records for potentially injured firefighters.

Exposure Reports should be reviewed by the Joint Health and Safety Committee or Health and Safety Representative to determine strategies to prevent illness and disease.

Attached is a sample Exposure Report that identifies the significant information that should be recorded. The reports are for department use only and are not to be sent to the Section 21 Committee, WSIB, or the Ministry of Labour. The intent of this reporting system is to develop and maintain an accurate record of exposures to firefighters through their careers. Firefighters need to maintain, and have access to their personal exposure reports. These reports will be useful in attempting to determine future illness or disease, when the likely cause may have originated from occupational exposure(s).
SAMPLE DRAFT EXPOSURE REPORT
Appended to Fire Fighter Guidance Note # 2-7

Employee Information

Employee’s Name: ________________________________
Employee’s Number: ___________________________
Vehicle assigned to: ____________________________
Supervisor/Officer: ____________________________

Incident Information

Incident Date: __________________
Alarm Time: ____________
Incident Number: ______________
Incident Location: (Address)____________________________________________________

Incident Type:
☐ Residential Fire
☐ Industrial Fire
☐ Vehicle Fire
☐ Commercial Fire
☐ Trash/Dumpster Fire
☐ Marine Fire
☐ Aircraft Fire
☐ Wild Land Fire
☐ Truck/Transport Incident
☐ Rescue
☐ Haz-Mat Spill
☐ Explosion
☐ Railroad Incident
☐ Training
☐ Extrication
☐ Other

If other checked: (describe) ____________________________________________________________________
List other firefighters working in close proximity at the time of exposure: _________________________________
__________________________________________________________________________________________

Exposure Information

Fire Stage
☐ Early Stage
☐ Free Burning
☐ Smoldering
☐ Extinguishment

Activity
☐ Light Overhaul
☐ Entry/ Ventilation
☐ Non-fire Incident
☐ Rescue

Fire Stage
< 1 Hr.
1-2 Hr.
2-3 Hr.
3+ Hr.

Activity
☐ Heavy Overhaul
☐ EMS. Support
☐ Investigation
☐ Other

Personal Protective Equipment

Indicate the P.P.E. that was being used when exposure occurred:

P.P.E.: 
☐ Bunker Pant
☐ N-95 Mask
☐ Safety Glasses
☐ Bunker Coat
☐ Face Shield
☐ Station Wear
☐ Bunker Boots
☐ Balaclava
☐ Protective Gown
☐ Gloves
☐ S.C.B.A.
☐ Medical Gloves

If other checked: (list) ________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
Materials Information

Materials Potentially Exposed to: (name) ___________________________________________ U.N. No. ____________________

Type of exposure (check applicable Boxes)

☐ Inhalation ☐ Ingestion ☐ Absorption ☐ Eye Contact

Colour of product: ___________________________________________

State of Product at time of exposure: (check applicable Boxes)

☐ Solid ☐ Liquid ☐ Smoke ☐ Combustion Products ☐ Vaporous (gas)

☐ Dust ☐ Mist (liquid) ☐ Invisible ☐ Odorous (distinctive smell) ☐ Other (explain below)

If other checked explain:

Symptoms

<table>
<thead>
<tr>
<th>At Incident</th>
<th>At Incident</th>
<th>At Incident</th>
<th>At Incident</th>
<th>After Incident</th>
<th>After Incident</th>
<th>After Incident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Irritation / Rash</td>
<td>Skin Irritation / Rash</td>
<td>Skin Irritation / Rash</td>
<td>Skin Irritation / Rash</td>
<td>Dizzy</td>
<td>Dizzy</td>
<td>Eyes burn</td>
</tr>
<tr>
<td>Nausea / Queasiness</td>
<td>Nausea / Queasiness</td>
<td>Nausea / Queasiness</td>
<td>Nausea / Queasiness</td>
<td>Cough</td>
<td>Cough</td>
<td>Unconscious</td>
</tr>
<tr>
<td>Cough blood / Nose bleed</td>
<td>Cough blood / Nose bleed</td>
<td>Cough blood / Nose bleed</td>
<td>Cough blood / Nose bleed</td>
<td>Ears Ringing</td>
<td>Ears Ringing</td>
<td>Other</td>
</tr>
<tr>
<td>Nose / Lung Irritation</td>
<td>Nose / Lung Irritation</td>
<td>Nose / Lung Irritation</td>
<td>Nose / Lung Irritation</td>
<td>Headache</td>
<td>Headache</td>
<td>None noticed</td>
</tr>
</tbody>
</table>

Treatment Information

Did employee receive treatment at scene: ☐ Yes ☐ No What treatment?

Did employee receive treatment at hospital: ☐ Yes ☐ No What treatment?

Type of treatment received: ☐ First Aid ☐ Oxygen ☐ Transported to hospital ☐ Hospitalization

Other comments (explain):

Time lost from duty? ☐ Yes ☐ No If yes, state number of days:

If decontamination was performed explain how: ____________________________________________________
__________________________________________________________________________________________
<table>
<thead>
<tr>
<th>Additional Event Details on How Exposure Occurred: (explain activities at scene, personal information, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Employee Signature:  
Date:  

Supervisor/Officer Signature:  
Date:  

SECTION THREE

Environment

Reducing Diesel Fumes in Fire Stations ................................................................. 3-1
Asbestos .................................................................................................................... 3-2
Heat and Cold Stress ............................................................................................... 3-3
ISSUE: REDUCING DIESEL FUMES IN FIRE STATIONS

Incomplete combustion of diesel fumes as produced by diesel engines produces nitrogen dioxide (NO2) and soot which contains polycyclic aromatic hydrocarbons (PAH). NO2 is a toxic, brown gas that is irritating to the nose, throat and eyes at low concentrations, and may cause lung disease at high concentrations of exposure.

Air sampling for these hazards has been found to be difficult and expensive. Results of these tests have been inconsistent.

The following action should be taken to limit exposure:

- Ventilate the fire hall by opening doors. Allow sufficient time for fumes to clear.
- Move trucks outdoors as soon as possible after start up. Trucks equipped with air brakes should be moved as soon as the low pressure warning devices deactivate.
- Isolate living quarters from the trucks ensuring doors are self-closing and have adequate door seals. Pole holes should be protected by covers or be enclosed in vestibules with appropriate doors.
- Wash clothing, blankets, bedding, drapes and other surfaces contaminated with soot and other products of combustion.
- Have the Joint Occupational Health and Safety Committee review this guideline and suggest other measures appropriate to a particular fire station.

Exposure to diesel fumes can be reduced through engineering controls at the source. The discharge of air from any exhaust system should be in such a manner so as to prevent the return of contaminants to the workplace.

The Section 21 Committee strongly recommends the installation of direct capture type exhaust system extractors when stations are being renovated or newly constructed. Consideration should be given to having direct capture type exhaust extractors installed in all existing fire stations.

A reduction in soot discolouration of stations will be a visible indication that your controls are reducing exposure to fire fighters.
FIRE FIGHTERS GUIDANCE NOTE # 3-2

ISSUE: ASBESTOS

Asbestos is a generic term for a group of naturally occurring mineral fibres known for their strength, flame and heat resistance. Harmful asbestos fibres are so small they are invisible to the naked eye. These small fibres may be carried on the wind for long distances.

When working in buildings constructed prior to 1992, it should be assumed that asbestos may be present. Asbestos was used in buildings prior to 1992 in a variety of ways, including: boiler and pipe insulation, curtains, plasters, floor tile, wall coverings, electrical insulation, fire proofing of structural members and even in homes in roofing materials, wallboard, refrigerators, paints and insulation. An incident involving an older structure may disturb asbestos fibres and present a hazard to firefighters.

O. REG. 278/05 - DESIGNATED SUBSTANCE — ASBESTOS ON CONSTRUCTION PROJECTS AND IN BUILDINGS AND REPAIR OPERATIONS

Effective January 1, 2011, fire department operations conducted on emergency scenes are exempted from the provisions of O. Reg. 278/05. This exemption, contained in Section 2 (5) of O. Reg. 278/05, applies to firefighters and fire investigators and commences with the arrival of the fire department on the emergency scene and continues through and until the completion of the origin and cause investigation activities.

Once control of the building or property has been released by the fire department, the exemption for emergency work undertaken by firefighters or fire investigators terminates.

Training Activities / Building Maintenance Operations in Fire Stations

The exemptions for emergency work referenced above do not apply to non-emergency fire department activities including training evolutions in acquired structures nor do they apply to any building construction or maintenance operations in fire stations. The provisions of O. Reg. 278/05 apply to these types of operations.

REG. 833 - CONTROL OF EXPOSURE TO BIOLOGICAL OR CHEMICAL AGENTS

Reg. 833 applies to fire department operations on emergency scenes. Specifically, fire departments are required to provide, and workers are required to use, personal protective equipment that is appropriate in the circumstances to protect workers from the hazard of asbestos. Airborne asbestos is hazardous if inhaled.
During emergency operations, the use of positive-pressure SCBA and structural firefighting bunker gear prevents exposure to airborne asbestos. SCBA should be worn by all personnel working within the hazard zone. Wetting down areas that may contain asbestos will also significantly reduce the risk of airborne exposure.

Personnel involved in origin and cause investigation work should wear either SCBA or appropriate respiratory protection in accordance with GN # 4-9 and GN # 4-13.

During emergency operations, the risk of inhalation exposure is prevented through the proper use of SCBA or appropriate respiratory protection. Monitoring or testing of airborne asbestos concentrations is not required under these circumstances.

Fire Department Training Requirements

Fire departments should:

- Train all firefighters to recognize buildings and areas of buildings that are likely to contain asbestos, the hazards associated with asbestos, the appropriate personal hygiene and work practices (including decontamination).
- Provide training on sources of information relating to asbestos including asbestos management plans (in accordance with the building owners’ responsibilities under O. Reg. 278/05) and building owner consultations.
- Provide SOPs/OGs requiring that appropriate respiratory protection be worn from the commencement of emergency operations on scene through and until the completion of the origin and cause investigation activities.

Post-Incident Clean-up

Upon completion of emergency operations and/or origin and cause investigation, fire departments should conduct the on-site clean-up of personnel and equipment, while using appropriate respiratory protection, as follows:

- Brush off debris from PPE, tools and equipment
- Gently rinse off the equipment with low pressure water or clean with a damp cloth
- Where available, a vacuum equipped with a HEPA filter can be used in lieu of rinsing off with water or damp cloth cleaning
- Cloths used for cleaning should be identified as possible asbestos containing material and left on scene in the care and control of the property owner
Upon returning the fire station, personnel should shower and should ensure that any soiled PPE is washed in accordance with manufacturer’s recommendations.

In developing SOPs/OGs relating to emergency operations that may involve buildings containing asbestos, fire departments should also consult the following Guidance Notes:

- GN # 4-9 – Respiratory Protection Program
- GN # 4-13 – Personal Protection During Fire Investigation Operations
- GN # 6-12– Rehabilitation During Emergency Operations
- GN # 6-23 – Safety During Salvage and Overhaul
- GN # 7-2 – Training Requirements
- GN # 7-5 – Live Fire Training for Acquired Structures
FIRE FIGHTERS GUIDANCE NOTE # 3-3

ISSUE: HEAT AND COLD STRESS

HEAT STRESS:

Firefighters may suffer serious injury or death due to heat stress, during emergency response and training exercises. Departments should develop training programs that assist firefighters and supervisors in recognizing signs of heat stress. SOPs/OGs should also be produced to assist firefighters in alleviating the causes of heat stress, and should include, but not be limited to, the following:

1. Recognition of heat related stress:
   - heat stroke
   - heat exhaustion
   - heat cramps
   - heat rash
   - transient heat fatigue
   - fainting

2. Methods to assist in alleviating and managing heat related stress:
   - fluid intake
   - work rotation
   - dressing down from full protective clothing
   - rotating firefighters to areas that may provide cooler temperature by use of air conditioning, or provision of shade
   - have firefighters rest

Firefighters should reschedule non-emergency activities to avoid the risk of heat related stress.
COLD STRESS:

Firefighters may also suffer injury from potential adverse effects of over-exposure to cold. These exposures may occur when firefighters are exposed to low temperatures, wind and/or moisture for significant periods of time. Departments should develop training programs to assist firefighters and supervisors in recognizing the signs of cold related stress. SOPs/OGs should be produced to assist firefighters in alleviating cold-related stress, and should include, but not be limited to, the following:

1. Recognizing the signs and symptoms of:
   - frostbite
   - hypothermia

2. Controls to manage cold stress:
   - work rotation to allow firefighters to rehabilitate where a source of heat is available, protected from wind, rain, snow etc.
   - advise firefighters to wear multiple layers of loose fitting clothing
   - protection of hands, feet, face and head
   - advise firefighters to report to a supervisor, any cold related stress symptoms to themselves or the crew

Firefighters should re-schedule non-emergency activities to avoid cold-related stress.

Further information from the Ministry of Labour can be found in Appendix D.
SECTION FOUR

Personal Protective Equipment

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FIRE FIGHTERS GUIDANCE NOTE # 4-1

ISSUE: APPLICATION OF FIREFIGHTERS - PROTECTIVE EQUIPMENT REGULATION

Ontario Regulation 714/94 “Firefighters – Protective Equipment” requires that firefighters who may be required to perform interior structural fire suppression duties be equipped with protective turn out clothing that meets or exceeds the requirements of CAN/CGSB 155.1-M88. This protective clothing, commonly referred to as bunker clothing, is primarily designed to protect firefighters during fire fighting operations.

There are good reasons at times for wearing bunker clothing for auto extrications, grass fires, medical emergencies, and other responses. However, bunker clothing including other Personal Protective Equipment (PPE) may not be the most suitable protection for some activities, particularly during the summer months. Joint Health and Safety Committees or Health and Safety Representatives should evaluate the appropriateness of using bunker clothing as PPE for non-fire incidents considering the potential for heat stress, reduced mobility, and added weight. Where there is a regular need for PPE for which bunker clothing is adequate but not the most suitable, Joint Health and Safety Committees or Health and Safety Representatives should recommend alternative protection and guidelines for use.

It is not the intent of this Guidance Note to prohibit wearing of bunker gear during all non-fire fighting exercises. It is the intent of this Guidance Note to encourage Fire Departments to sit in consultation with their local Joint Health and Safety Committees or Health and Safety Representatives and agree on the operational guidelines of when and where bunker gear is to be worn and under what guidelines the Company Officer could exercise his/her own discretion.

When replacing protective turn out clothing it should be appropriately sized to the individual. CAN/CGSB 155.1-M88 addresses the criteria to ensure a proper fit.

The Fire Service Section 21 Committee recommends that fire departments, when purchasing new structural firefighting boots, gloves, protective hoods, and head protection for structural firefighting, that the PPE meet NFPA 1971 – 2000 edition (Standard on Protective Ensemble for Structural Fire Fighting).
FIRE FIGHTERS GUIDANCE NOTE # 4-2

ISSUE:   EYE PROTECTION

Where a worker is exposed to the hazard of eye injury, eye protection appropriate in the circumstance should be worn. Helmet shields do not provide adequate eye protection during the normal course of activities undertaken in the fire service. When it is necessary to use self-contained breathing apparatus (SCBA) the face piece of the (SCBA) will provide suitable eye protection under normal use.

The following are some examples of where eye protection is needed (if SCBA is not required):

- Auto extrication activities involving the use of cutting tools, hydraulic tools or breaking glass.
- Typical shop/maintenance activities like cutting, grinding etc.
- Fire-overhaul procedures.
- When chemical hazards are encountered.
- Where pressurized containers are involved.
- Where blood or other bodily fluids may be projected towards the eye.
- During specialized operations (water rescue, building collapse, high angle rescue), trench rescue, confined space rescue, or wild land fire fighting.
- During prolonged or acute exposure to sunlight (i.e. during water rescues or ladder operations).

Eye protection should be cleaned after each use, following the manufacturer's directions.
FIRE FIGHTERS GUIDANCE NOTE # 4-3

ISSUE:STRUCTURAL FIREFIGHTING BOOTS AND GLOVES

Firefighters exposed to the hazard of foot or hand injury shall wear protective boots or gloves appropriate in the circumstances.

Boots meeting the NFPA 1971 - 2000 edition (Standard on Protective Ensemble for Structural Fire Fighting) are acceptable:

Gloves meeting the NFPA 1971 - 2000 standard are acceptable. Leather or other synthetic gloves appropriate to protect from injuries due to heat, flame, sharp or abrasive objects are acceptable for direct fire fighting activities.
FIRE FIGHTERS GUIDANCE NOTE # 4-4

ISSUE: PERSONAL ALERT SAFETY SYSTEMS (PASS)

Every fire fighter performing interior structural fire fighting should have a Personal Alert Safety System (PASS) attached to his or her self-contained breathing apparatus. This PASS should unit a piercing sound when the fire fighter is motionless or when manually activated.

The purpose of the PASS is to assist in locating a fire fighter who may be injured, trapped or unconscious particularly in conditions of low visibility due to smoke. Prompt rescue is essential to prevent serious injury or death due to smoke inhalation as a result of the fire fighter running out of air.

Although firefighters should always use a buddy system, there have been several cases where low visibility due to smoke has led firefighters to become disoriented and separated from their team. For this reason, PASS should be used in conjunction with entry control procedures.

The use of a Personal Alert Safety System by firefighters may be necessary in hazardous environments other than structural fires as well Fire Departments should review their own operating procedures to ensure PASS devices are worn if required in confined spaces, hazardous materials incidents, etc.

Desirable features when purchasing new PASS devices should include:

- compliance with the 1993 edition of the NFPA 1982 standard (Standard on Personal Alert Safety Systems (PASS));
- a separate high temperature alarm circuit and signal;
- durability (i.e. resistance from damage due to water, chemicals, temperature extremes, rough handling);
- ease of operation (i.e. on/off indicator light, controls that may be operated with gloved hands, low battery indicator, pre-alert signal); and
- a reliable maintenance and repair program.
FIRE FIGHTERS GUIDANCE NOTE # 4-5

ISSUE: PROTECTIVE HOODS

Protective hoods when used in fire fighting duties must meet the requirements set out in NFPA 1971 – 2000 edition (Standard on Protective Ensemble for Structural Fire Fighting).

The purpose of the helmet liner and protective hood ensemble is to protect a fire fighter’s head, face, and neck from heat and flame not otherwise protected by the protective coat, helmet, or self-contained breathing apparatus face-piece.

Protective hoods should be worn when a fire fighter's coat, helmet and self-contained breathing apparatus face-piece does not provide protection from heat and flame.

Protective hoods do not eliminate the requirement for helmet liners.
FIRE FIGHTERS GUIDANCE NOTE # 4-6

ISSUE:  FIREFIGHTER HELMETS

Section 4 of Ontario Regulation 714/94 Firefighters – Protective Equipment outlines the requirements with respect to head protective equipment for firefighters as follows:

S. 4.  (1) A firefighter who is exposed to the hazard of head injury shall wear head protective equipment that is appropriate in the circumstances.
(2) The employer shall provide training and instruction to every firefighter in the proper care and use of head protective equipment and in the limitations of protection afforded by it.
(3) Head protective equipment shall be kept in good condition and shall be inspected periodically by the employer.

Firefighting is by its nature a dangerous activity. Use of a fire helmet is essential in many emergency and training activities where there is an exposure to the hazard of head injury. However, the helmet is not designed to protect the wearer from all conditions or hazards. It is designed to provide limited protection to the head when worn during structural firefighting activities. Exposure to flashovers, collapses, falls, and other conditions may exceed the protective capacity of the helmet.

Correct helmet size and fit are important to provide optimum protection against heat and impact from falling objects. The use of a balaclava and/or self-contained breathing apparatus (SCBA), and activities causing rapid movements require a correctly fitted helmet. The helmet must fit firmly on the head with the chin strap securely fastened to provide maximum protection.

Fire helmets are not designed for crash protection and should not be worn by persons riding in the enclosed cab and crew area of fire apparatus. They will interfere with head clearance and put the occupant at greater risk of neck or back injury should there be an apparatus rollover or other motor vehicle incident. In accordance with Section 7 (4) of O. Reg. 714/94, where carried in the cab of a fire truck, helmets are to be secured to fixed positions by positive mechanical means or stowed in compartments with positive latching doors to ensure that they do not become a projectile in event of a collision.

When operating at an emergency scene where the activities do not require that the full face piece of respiratory protection is worn, yet there is an exposure to the hazard of eye injury, the use of goggles or safety glasses for eye protection is necessary. The face shield provides limited protection to the facial area that it covers and is not considered a means of primary eye protection meeting the Canadian Standards Association (CSA) Standard Z94.3-07 Eye and Face Protectors, or the American National Standards Institute (ANSI) Z87.1-2010 Standard for
Occupational and Educational Personal Eye and Face Protection Devices. Removal of goggles or face shield voids the helmet’s NFPA certification.

Helmet elements should be inspected for the following:

- Soiling and Contamination
- Physical damage to the shell such as:
  - Cracks, crazing, dents, and abrasions
  - Thermal damage to the shell (bubbling, soft spots, warping, discolouration)
- Physical damage to the liner / earflaps such as rips, tears, and cuts
- Thermal damage (charring, burn holes, melting)
- Damaged or missing components of the suspension and retention systems
- Damaged or missing components of the face shield/goggle system, including discolouration, crazing, and scratches to the face shield/goggle lens limiting visibility
- Damaged or missing reflective trim

Note: Only those accessories that are approved by the manufacturer should be affixed to the helmet.

Reference: GN # 4-12 Firefighter Head Protection (Structural Firefighting)
FIRE FIGHTERS GUIDANCE NOTE # 4-7

ISSUE: WILDLAND FIRE FIGHTING, PROTECTIVE CLOTHING AND EQUIPMENT FOR MUNICIPAL FIRE DEPARTMENTS

This Guidance Note is intended to provide information and guidance to municipal fire departments that may become involved in grass, brush and wildland fires. Firefighters working in stations where the fire department has an agreement with the Ministry of Natural Resources, and/or where all three of the following criteria are met, should be provided with appropriate head, foot, and eye protection for wildland firefighting:

- If the station’s fire related responses are more than 15% grass, brush, or wildland fires based on a five-year average, and

- If 5% of grass, brush or wildland fires exceed more than one hectare in size based on a five-year average, and

- If 15% of grass, brush or wildland fires are more than one hour duration (Attack and Suppression) on a five year average.

Fire departments involved in grass, brush, or wildland fires that do not meet the above criteria, should consider the following issues:

- Structural fire fighting helmets provide adequate protection but can become overly heavy in these circumstances. Fire departments should consider other head protection that can be properly secured to the head by way of a chin strip and eye protection where appropriate.

- Although rubber fire fighting boots provide adequate protection, they can add to fatigue if worn for a long period of time or to travel long distances on uneven terrain. Fire departments should consider alternative footwear where this potential exists. Footwear should provide toe protection and address puncture resistance and melting when exposed to hot embers, etc.
- Outerwear should be flame resistant and provide protection to the legs, torso and arms. When worn as an ensemble with gloves and boots, the pant cuff and wrist design should be such that skin exposure is prevented.

- Current practice is to consider wildfire smoke not immediately dangerous to life and health (IDLH). Exposure to wildfire smoke should be limited as much as possible by operational procedures.

The majority of documented injuries to wildland fire fighting are related to heat stress (reference Appendix D1 and D2).
FIRE FIGHTERS GUIDANCE NOTE # 4-8

ISSUE: INSPECTION AND REPLACEMENT OF STRUCTURAL FIREFIGHTING BUNKER GEAR

Care and maintenance of structural firefighting protective clothing (“bunker gear”) is of utmost importance. Life expectancy of bunker gear depends on such factors as the type of and amount of use to which each garment has been exposed and the length of time since it was manufactured.

Fire departments should develop procedures that ensure that bunker gear is inspected on a regular basis and assessed at each regular inspection to determine whether the garment needs to be replaced. All bunker gear should be inspected for the following:

- Bunker gear is a component garment – outer shell, thermal barrier, and moisture barrier. Each component needs to be evaluated.
- Char heat and UV damage:
  - all three layers are to be inspected
  - burn holes or discoloration must be repaired
  - look for loss of tensile strength.
- Fabric or material damage:
  - torn, ripped, cut or abraded materials should be taken out of service and repaired or replaced
  - moisture barrier material that is peeling, cracked or chaffed should be replaced.
- Thread or seam damage:
  - all seams should be inspected for thread or seam damage and re-stitched.
- Reflective trim:
  - check for breaks and brittleness and replace when necessary.
- Velcro:
  - torn or worn velcro, or velcro that will not hold its closure, should be replaced.
If any of the above is observed in a garment, it should be repaired immediately. Any loss of strength or weakening of materials to the degree where the material can be torn with manual pressure should be considered unsafe.

A combination of any of the above problems may warrant consideration for replacement.

**When replacing bunker gear it should be appropriately sized to the individual.**

**Note:** Garments should be kept clean, as soiled or dirty garments reduce the effectiveness of protection.

Depending on its condition and the circumstances, it may still be possible to use bunker gear that has been removed from fire fighting or emergency service operations for activities (such as certain training evolutions) that do not involve the risk of exposure to thermal hazards. Retired bunker gear to be used for purposes other than fire fighting or emergency service operations should be appropriately marked as being for non-live fire training only.

**Reference:**

Section 5 of Ontario Regulation 714/94 Firefighters – Protective Equipment, regarding the standards for structural firefighting protective garments.

For additional information regarding the maintenance of structural firefighting bunker gear, NFPA 1851, 2008 edition, and/or manufacturers’ instructions may be consulted by fire departments.
FIRE FIGHTERS GUIDANCE NOTE # 4-9

ISSUE: RESPIRATORY PROTECTION PROGRAM

Firefighters (as defined by the Fire Protection and Prevention Act), as a condition of their work, may be exposed to dust, mist, fumes, gas, vapour and smoke. The employer should make every effort to prevent exposure to such hazards by means of technical controls. When exposure to respiratory hazards cannot be avoided or effectively controlled, workers should use appropriate respirators.

The Ministry of Labour recommended in a letter dated February 4, 1987, and sent to fire services across the province that positive pressure (pressure demand) respirators should be used by firefighters for their protection as demand respirators may not provide adequate protection due to the hazardous fumes and gases that can enter the respirator in certain circumstances. The letter indicated that demand (negative pressure) respirators should be converted or replaced. The CSA Z94.4 and NFPA 1981 standards both require that positive pressure respirators are used for structural firefighting.

CSA Standard Z94.4 Section 6.3.2.4.1 requires that for structural firefighting, pressure-demand SCBA with a rated service time of 30 minutes or more shall be used (the requirements of NFPA 1981 should be consulted for additional performance requirements for SCBAs for firefighting).

The employer should develop a respiratory protection program covering the following:
- program administration (note that a Fire Department should post the name of the Respiratory Protection Program Administrator). It is recommended that Program Administrators take the CSA course “Quality Breathing Air – A One Day Training Program for Respiratory Protection Program Administrators in the Fire Service”
- written records documenting the respiratory protection program
- proper training in the selection and use of respirators, including the proper use of Rapid Intervention/Universal Air Connections
- maintenance, storage, inspection and limitations of respirators
- protective clothing or other safety device that has been worn next to the skin shall be cleaned and disinfected prior to being worn by another worker
- protective equipment assigned exclusively to a worker shall be cleaned and disinfected by the worker following each use
fit testing of workers to ensure an effective seal will be conducted prior to initial use, and at least every 2 years; however, it is recommended that fit tests be conducted annually (per Section 7.1.3 of CSA Z94.4) or whenever work conditions necessitate a change in the type of respirator worn, with periodic review during the worker’s career to ensure proper fit.

- a process to certify any used personal protective equipment that is obtained. This equipment should be certified to the manufacturer’s specifications (at date of manufacture) by the manufacturer or authorized agent, prior to being put into service.

- quality of compressed air used in SCBA cylinders (reference CSA Standard Z180.1)
  Note: It is recommended that air quality tests be conducted prior to filter change and following major service work, modifications or extensive repairs.

- under what conditions a respirator must be worn, such as:
  - when an unknown atmosphere is suspected of being hazardous
  - when the atmosphere is known to be hazardous (i.e. overhaul)
  - when the atmosphere may rapidly become hazardous (e.g. wind change)
  - when employees are working below ground level or inside a confined space (unless the safety of the atmosphere can be established by testing and continuous monitoring)
  - when an employee may be exposed to biological hazards

- Fire Departments may want to consider longer duration SCBA cylinders based on risk assessment of larger and/or complex structures.

- program evaluation.

The employer and workers are encouraged to work together to develop and maintain a voluntary physical fitness program designed to improve the cardiovascular fitness of firefighters – reference material for developing a physical fitness program is available in NFPA 1500.

Further information regarding Respiratory Protection is available by referencing CSA Standards Z94.4 and Z180.1 and NFPA 1981.
FIRE FIGHTERS GUIDANCE NOTE # 4-10

ISSUE: HEARING PROTECTION DURING EMERGENCY OPERATIONS

Firefighters may be exposed to sound levels greater than an equivalent noise exposure level of 85 dBA.

The employer should develop a hearing protection program to identify when hearing protection should be used during emergency operations. This identification may be accomplished through noise level testing of fire apparatus and equipment likely to be used during emergency operations.

Hearing protection should be used by firefighters when operating power tools or operating or riding on fire apparatus where they are likely to be exposed to noise equal to or in excess of those shown in the table of equivalent noise exposures below.

<table>
<thead>
<tr>
<th>Steady Sound Level dBA</th>
<th>Duration per 24 hour day</th>
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<tbody>
<tr>
<td>82</td>
<td>16 hours</td>
</tr>
<tr>
<td>85</td>
<td>8 hours</td>
</tr>
<tr>
<td>88</td>
<td>4 hours</td>
</tr>
<tr>
<td>91</td>
<td>2 hours</td>
</tr>
<tr>
<td>94</td>
<td>1 hour</td>
</tr>
<tr>
<td>97</td>
<td>30 minutes</td>
</tr>
<tr>
<td>100</td>
<td>15 minutes</td>
</tr>
<tr>
<td>103</td>
<td>7.5 minutes</td>
</tr>
<tr>
<td>106</td>
<td>3.75 minutes</td>
</tr>
<tr>
<td>109</td>
<td>1.88 minutes</td>
</tr>
</tbody>
</table>

The employer should establish a hearing conservation program to identify and reduce or eliminate potentially harmful sources of noise in the work environment that are under the control of the employer. Employers should try to eliminate firefighters’ exposure to noise levels above those shown in the table by engineering out the noise with better mufflers and/or insulation if appropriate. However, personal protective devices should be used where reduction or elimination strategies do not achieve the required exposure reduction.

Note: When in fire stations, reference the requirements of Section 139 of the Regulations for Industrial Establishments (Regulation 851).
FIRE FIGHTERS GUIDANCE NOTE # 4-11

ISSUE: FALL PROTECTION FROM ELEVATING DEVICES

Fire Departments using elevating devices (aerials or platforms) need to address fall protection.

There are three systems that could be used in different situations to protect a person from falling:

- A travel restraint system is for limiting the movement of its user from approaching the danger zone, i.e. where he or she may fall, or within a protected area, e.g. within the confines of the railings of the aerial device. It consists of a belt, an attachment hook, and an anchor point.

- A fall-restricting system that consists of the use of a full body harness, a short lanyard that limits a fall to two feet or less, and an anchor point.

- A fall-arrest system that consists of a full-body harness, a static or shock absorbing lanyard and an anchor point.

While it is important to use proper equipment, and train firefighters in the proper use of it, a critical component of the system for ensuring firefighters are protected, is the anchor or attachment point for the equipment.

The Regulations for Construction Projects specifies the anchor point design loads for different fall protection systems:

The anchor point for a Travel Restraint System must be capable of supporting a static force of at least 2 kilonewtons, which is equivalent to 450 lb. or 204 kg. The anchor point for a Fall Restricting System and a Fall-Arrest System must be capable of supporting when it is used with a shock-absorbing lanyard a static force of at least 6 kilonewtons, which is equivalent to 1350 lb. or 612 kg. Without the shock-absorbing lanyard, the anchor point must be capable of supporting a static force of at least 1,800 lb.
When designing a fall prevention system for aerial device, load capacities must be considered. Aerial ladders are only designed to withstand a minimum load capacity of 550 lb. or 250 kg. In most cases given these restrictions the most appropriate system to be used is the Travel Restraint System. All platforms and towers are normally designed to higher load requirements and are equipped with guardrails, which are considered to be the first level of fall prevention.

It must be emphasized that fall protection systems can only protect firefighters while they remain on the aerial device. There is practically no effective means at this time to protect a fire fighter entering the fire ground from the aerial device or returning to it. During these transitions the use of fall protection may cause restrictions to the fire fighter’s movements, which may be more dangerous. Firefighters should use extreme care and their professional judgement for protection while mounting or dismounting from an aerial device to a structure.
FIRE FIGHTERS GUIDANCE NOTE # 4 -12

ISSUE:    FIREFIGHTER HEAD PROTECTION (STRUCTURAL FIREFIGHTING)

A firefighter who is exposed to the hazard of head injury should wear head protective equipment that is appropriate in the circumstances.

A fire fighting helmet that meets the requirements of NFPA 1971 – 2000 edition (Standard on Protective Ensemble for Structural Fire Fighting) will provide appropriate protection for structural fire fighting.
FIRE FIGHTERS GUIDANCE NOTE # 4 -13

ISSUE: PERSONAL PROTECTION DURING FIRE INVESTIGATION OPERATIONS

Following extinguishment of fires, incomplete combustion will create a hazardous atmosphere. This places personnel involved in operations such as overhaul and fire cause determination, at risk of exposure to these contaminants.

Whenever possible, investigations should be delayed until such time as all phases of fire have been fully extinguished. Adequate and effective ventilation should also be in place throughout the investigation.

Further, those involved in fire investigations should ensure that either the immediate vicinity or the entire area is de-energized, also, that the natural gas, propane or other fuel sources are isolated, disconnected, or shut-off.

Fire Departments should ensure that all personnel within a potentially contaminated atmosphere wear adequate respiratory protection. CSA Z-94.4-02 – “Selection, Use and Care of Respirators” should be consulted by the fire department when developing and implementing a respiratory protection program.

Where SCBA or other types of respiratory protection are provided to fire investigation personnel, fire departments should ensure that appropriate training is provided on the safe and effective use of the equipment.

Before respiratory protection is removed, personnel should take every reasonable precaution to ensure that the atmosphere is safe to work in (e.g. air monitoring to determine the presence of common contaminants).

In addition to respiratory protection, a number of personal safety precautions should be observed by those involved in fire investigation. Fire departments should ensure that the following Guidance Notes are followed:
- GN #2-7 Reporting Exposures to Biological, Chemical or Physical Agents
- GN #4-2 Eye Protection
- GN #4-3 Structural Firefighting Boots and Gloves
- GN #4-9 Respiratory Protection Program
- GN #4-12 Firefighter Head Protection (Structural Firefighting)
- GN #6-23 Safety During Salvage and Overhaul
FIRE FIGHTERS GUIDANCE NOTE # 4-14

ISSUE: INFECTION PREVENTION AND EXPOSURE CONTROL PRACTICES

Firefighters risk contracting communicable diseases from exposure to blood, body fluids, secretions, excretions, mucous membranes, non-intact skin, sharps, medical waste or soiled items. Routine practices for infection prevention and exposure control are based on the premise that all persons are potentially infectious, even when they display no symptoms (are asymptomatic). Therefore the same standards of practice should be used routinely with persons during care at all times, including in-station operations.

Routine practices are infection prevention and exposure control measures that include an ongoing or “point of care” risk assessment (to determine the potential for exposure to blood and body fluids or contaminated equipment), hand hygiene, barrier equipment, environmental controls and education.

The employer is responsible for assessing the potential risk of occupational exposure to communicable diseases in the workplace and for applying a standard of routine practices to prevent or reduce the risk of transmission at the scene and upon return to the station. The employer is also responsible for training workers on the routine practices so that the worker is able to perform a “point of care” risk assessment and evaluate the general risk of each patient encounter and determine the range of precautions to be implemented.

It is imperative that personnel consistently use routine practices when treating individuals or assisting with their care, including the following:

- proper hand washing
- cleaning and disinfection practices
- training and education on selection, use and limitations of personal protective equipment (PPE)
- education on infectious diseases and methods of spread/exposures

When the ongoing or “point of care” risk assessment indicates a potential for transmission, appropriate PPE should be used. When used properly, PPE provides an exposure barrier to prevent transmission from patient to worker and worker to patient. Barrier equipment includes:

(a) Hand protection
(b) Eye protection
(c) Respiratory protection, and
(d) Skin protection
Fire departments need to consult with persons who have expertise in infection control matters such as their local health officials (which may include the Medical Officer of Health), emergency medical services (EMS), Regional Infection Control Networks, Health and Safety Associations, or others, to determine the appropriate PPE for use in each of the categories listed above.

A worker’s risk of contracting communicable diseases could also be reduced by immunization in accordance with the National Advisory Committee on Immunization (NACI) Canadian Immunization Guide (Public Health Agency of Canada), 7th Edition, 2006.

Reference:

GN # 2-5 Designated Officer Program for Communicable Disease
GN # 2-7 Reporting Exposures to Biological, Chemical or Physical Agents
GN # 4-1 Application of Firefighters – Protective Equipment Regulation
GN # 4-2 Eye Protection
GN # 4-9 Respiratory Protection Program
Section 21 Manual Appendix F: Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008
SECTION FIVE

Personnel Accountability

Firefighter Accountability and Entry Control.......................... 5-1
FIRE FIGHTERS GUIDANCE NOTE #5-1

ISSUE:  FIREFIGHTER ACCOUNTABILITY AND ENTRY CONTROL

The employer must ensure that whenever the incident command system is utilized that it contains provisions for firefighter accountability and entry control at the emergency scene. It is recommended that employers establish written policies and operational guidelines for personnel accountability and entry control in accordance with the provision of their own incident command systems.

The accountability system may be adapted to individual fire department resources but must incorporate the following key principles:

- The accountability system accounts for the location and function of all personnel at an incident.
- The accountability/incident command systems provide a means for maintaining span of control.
- The accountability/incident command system provides a means for the emergency removal of crews from the interior of a hazard zone when conditions present an immediate life hazard.
- The accountability/incident command system establishes written protocol for when and under what conditions personnel are assigned as Accountability/Control Officers.
- The accountability/incident command system eliminates freelancing.
SECTION SIX

Procedures

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FIRE FIGHTERS GUIDANCE NOTE # 6-1

ISSUE: PERSONS RIDING ON FIRE APPARATUS TAILBOARDS

Studies conducted by the National Fire Protection Association (NFPA) in recent years have proven that firefighters are needlessly injured or killed each year by outdated apparatus riding practices.

Current NFPA standards 1500 "Fire Department Occupational Safety and Health Program" and 1901 "Automotive Fire Apparatus" as well as safety standards in the provinces of Alberta, Saskatchewan, and British Columbia call for firefighters to be transported within the body of the vehicle.

Jump-seats do not provide the protection of enclosed cab, but do provide better protection than tailboards, and should be utilized, instead of tailboards, if available. If personnel ride in jump-seat areas they should be seated and prevented from accidental ejection by safety bars, nets or harnesses approved by the Joint Health and Safety Committee (JHSC).

Where firefighters must ride tailboards because there is insufficient seating either inside or in jump-seats for the number of personnel carried, the following safety precautions are to be followed:

- adequate handles and suitable safety belts or harnesses must be provided as approved by JHSC;
- tailboard surfaces are to provide safe footing;
- no personnel are to stand on the sides of fire apparatus during transport to or from calls;
- each firefighter must have a minimum standing space of 22" x 22" on the tailboard;
- the tailboard shall be sufficient strength for the capacity that may be carried; and
- an electrical signal system or voice communication system between the tailboard and driver's compartment must be provided.

**Note:** It is safer to transport firefighters in vans, station wagons or other vehicles designed to carry passengers, than to ride the tailboard.
FIRE FIGHTERS GUIDANCE NOTE # 6-2

ISSUE: FIRE FIGHTING NEAR WATER

Where a firefighter is exposed to the hazard of falling into water (e.g. fire fighting activities around wharfs and boats) the following precautions should be taken:

- Training in the unique aspects of combating these fires (e.g. boat or wharf fires) including vessel type and construction, stability, entry into confined spaces, extrication, dewatering strategy, command, suppression, ventilation, hypothermia, hot steel surfaces, additional personal protective and other equipment and resources required;

- Wearing of personal flotation devices by firefighters performing tasks such as line handling, particularly where the shoreline is slippery or steep, or where the firefighter is engaged in work where he or she may be pulled into the water;

- Personal flotation devices must not be worn at the expense of wearing full protective clothing and self contained breathing apparatus. Rather, safe working perimeters should be established to protect personnel from the hazards of working close to the water without having the required personal flotation equipment;

- Provision for adequate access and egress for emergency personnel by providing additional gangways, ladders, or other devices; and

- Provision for locating and rescuing firefighters who may fall into the water.

Note: A life jacket or personal flotation device stamped or labelled and approved by Transport Canada or the Canadian Coast Guard, Department of Fisheries and Oceans, meet with the intent of this Guidance Note.
FIRE FIGHTERS GUIDANCE NOTE # 6-3

ISSUE: WATER AND ICE RESCUE

Where fire departments respond to calls for water or ice rescues, employers should:

- Identify the emergency situations which may reasonably be expected to occur in that fire department’s response area;
- Train and equip firefighters, so that they can respond to those emergencies quickly, safely and effectively;
- Select, acquire, and maintain the appropriate rescue equipment required to safely perform the operations that may be expected.

Minimum precautions should include:

- All rescuers who enter the water are to maintain controlled contact with the shore/boat (i.e. safety line, hand contact). It should be noted that some rescue situations, such as, but not limited to, certain swift water situations may preclude rescuers from safely being connected to a rope. In these situations, appropriate safety measures should be taken to ensure the safety of rescue personnel. Those fire departments that may need to perform rescues in swift water should ensure that specific training is provided that addresses the unique hazards of swift water rescue;
- Rescue personnel who may be within close proximity to water where there is an exposure to the hazard of falling into the water, should wear an approved personal flotation device;
- Rescue personnel proceeding onto ice should wear an approved personal flotation device and clothing to reduce the effects of hypothermia (Note: where immersion suits are used as personal flotation devices, the requirements in the notation below apply);
- Direct rescuers on the ice should be secured by rescue equipment, appropriate in the circumstances, to ensure the worker’s rescue from the water/ice; and
- When using boats, ensure that the boat has the appropriate safety equipment and that the operator is competent to operate the vessel in the conditions encountered.

Note: A life jacket or personal flotation device stamped or labelled and approved by Transport Canada or the Canadian Coast Guard, Department of Fisheries and Oceans, meet with the intent of this Guidance Note.
FIRE FIGHTERS GUIDANCE NOTE # 6-4

ISSUE: ROPE RESCUE
(Previously known as HIGH-ANGLE RESCUE)

Rope rescue is a highly specialized function performed by some fire departments. It involves the use of special equipment and training to complete rescues from areas such as high structures, rough terrain, confined spaces and high rise buildings.

Fire departments that intend on providing technical rescue services, including rope rescue, should ensure that the provision of these disciplines are included in their establishing and regulating by-laws.

There are three distinct levels of rope rescue competency that fire departments should consider when establishing their level of response capability. Those departments who provide rope rescue services should ensure that the required training manuals, instructions and SOPs/OGs are developed in support of the applicable level of service being provided.

Awareness Level - The minimum capability for fire departments that respond to rope rescue incidents:

- Recognizing the need for a rope rescue;
- Identifying resources necessary to conduct rope rescue operations;
- Knowing how to contact the required resources where rope rescue is required;
- Carrying out site control and scene management;
- Recognizing general hazards associated with rope rescue and the procedures necessary to mitigate these hazards;
- Identifying and utilizing PPE assigned for use at a rope rescue incident.

Operations Level - For those fire departments that may be required to identify hazards, use equipment and apply limited techniques while assisting rope rescue technicians in a rope rescue:

- All the competencies contained in the Awareness Level section;
- Using a rope rescue system to move the victim and rescuers from one stable location to another;
- Using both high- and low-angle rescue techniques that include accessing, managing, and packaging the patient in such a way as to keep all personnel safe and reduce the potential for further harm to the patient.
Technician Level - For those fire departments that identify hazards, use equipment and apply advanced techniques to coordinate, perform and supervise rope rescue incidents:

- All the competencies contained in the Operations Level section;
- Accessing a patient using techniques that require rescuers to climb up or down natural or manmade structures, which can expose the climber to a significant fall hazard;
- Using rope rescue systems to move a rescuer and a patient along a horizontal path above an obstacle or projection;
- Performing a high-angle rope rescue of a person suspended from, or stranded on, a structure or landscape feature;
- Understanding and applying the principles of the physics involved in constructing rope rescue systems, including system safety factors, critical angles, and the causes and effects of force multipliers;
- Performing a high-angle rope rescue with a litter using tender(s) to negotiate obstacles, manipulate or position the patient, or provide medical care while being raised and lowered;
- Moving a patient packaged in a litter up and over an edge during a raising operation with a rope system;
- Selecting, constructing, and using a high-line rope system commensurate with the fire department’s needs;
- Utilizing a high-line rope system to transport rescuers, equipment, and an occupied litter commensurate with the fire department’s needs;
- Utilizing litter attendants within a high-line rope system.

Rope rescue requires regular training to maintain the skills and knowledge necessary to perform these tasks safely and competently. Where it is expected that the frequency of these emergencies will be low, significant attention should be given to ongoing training and practice in order to ensure that the required competencies are maintained.

When developing and operating a rope rescue program, fire departments should:

- Ensure that rope rescue training is only conducted by competent instructors who are properly qualified to instruct in these disciplines on the basis of knowledge, training and experience;
- Ensure that the required equipment and training is provided in accordance with the mandated level of service;
- Ensure that the required equipment and trained personnel are available to provide adequate backup and support for primary rescuers during a rope rescue;
- Ensure that formal processes and protocols are established and maintained for the acquisition, inspection, testing and replacement of all rope rescue equipment;
- Ensure that a formal Life Safety / Rescue Rope program is developed and maintained in accordance with Guidance Note # 1-5 Life Safety Rope and Equipment.
FIRE FIGHTERS GUIDANCE NOTE # 6-5

ISSUE: CONFINED SPACE RESCUE

Confined space rescues require special preparation to ensure that firefighters take the proper precautions to safely carry out their duties.

Effective July 1, 2011, the regulatory requirements with respect to confined spaces under the Occupational Health and Safety Act (OHSA) were consolidated into one regulation, O. Reg. 632/05 Confined Spaces. The provisions with respect to confined spaces that previously applied in the four sector-specific regulations (i.e. Industrial Establishments, Construction Projects, Mines and Mining Plants, and Health Care and Residential Facilities) were revoked.

The confined spaces provisions serve to ensure that workers entering, working in or working near confined spaces are protected.

Sections 4 – 7 and 9 – 21 of O. Reg. 632/05 do not apply to emergency work performed by a firefighter as defined in subsection 1 (1) of the Fire Protection and Prevention Act (FPPA), 1997, or a person who holds a certificate (gas technician) under the Technical Standards and Safety Act, 2000 who is working under the direction of a fire department as defined in the FPPA. “Emergency work” means work performed in connection with an unforeseen event that involves an imminent danger to the life, health, or safety of any person.

O. Reg. 632/05 states that a firefighter who performs emergency work shall be adequately protected by personal protective equipment, clothing and devices provided by the worker’s employer, training under Section 8 provided by that employer, and written procedures and other measures developed by that employer.

Section 8 of O. Reg. 632/05 outlines the hazard recognition and other general training requirements that apply to firefighters. The confined spaces provisions indicate that every worker who enters a confined space or who performs related work shall be given adequate training for safe work practices for working in confined spaces and for performing related work, including training in the recognition of hazards associated with confined spaces.

“Confined space” means a fully or partially enclosed space,

- that is not both designed and constructed for continuous human occupancy, and
- in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it.

To be defined as a confined space, the above conditions must apply. As such, simulators used in training by fire departments may not be considered confined spaces. The same fire department
policies and procedures that would apply to an emergency incident should be applied during training evolutions.

Fire departments should be aware that 911 emergency response capabilities for confined space rescue cannot be used by workplaces as their on-site rescue response protocol. Emergency services do not replace the requirement for on-site rescue procedures.

Where fire departments make contractual arrangements to provide confined space “on-site rescue” to private industry, fire departments are to ensure that firefighters are appropriately trained (i.e. plan-specific training) to perform the confined space rescue and are capable of immediately implementing the relevant plan and the written on-site rescue procedures that apply to the confined space. (Note: the hazard recognition and other general training requirements are not applicable here.)

Hazards in confined spaces may include toxic substances, lack of oxygen, moving equipment (e.g. augers, agitators), electricity, corrosive or toxic liquids, "quick-sand" type material such as moving grain, water, and falling objects.

The following are minimum precautions:

- ventilate flammable atmospheres below the LEL before entering
- pre-planning and training for confined space rescues
- inspect and calibrate gas detection devices
- ensure that established lock-out procedures for equipment and other hazards have been implemented and followed
- test the atmosphere before entry and continuously while crews are inside (Note: many toxic gases are odourless)
- where practical, ventilate the confined space before entry and continuously while crews are inside
- where a flammable or combustible material presents a fire hazard, station a fire crew in full protective gear with a backup hose-line at the entrance to the confined space
- rescuers who enter the confined space should:
  a. wear the appropriate protective clothing and equipment for the hazards involved
  b. be able to communicate with the back-up rescue team using the appropriate communications devices
  c. wear a full-body harness to which is securely attached a rope, the free end of which is fastened to a stationary object outside the confined space (Note: a mechanical retrieval device may be more effective than manual retrieval)
  d. be supported by an appropriately equipped back-up rescue team located at the entrance to the confined space
  e. establish traffic control to prevent injury to rescuers, and
  f. use appropriate rescue harnesses (i.e. Class III rescue harnesses).
Reference:

O. Reg. 632/05 Confined Spaces
GN # 1-5 Life Safety Rope and Equipment
GN # 6-4 Rope Rescue
NFPA 1670 Standard on Operations and Training for Technical Rescue Incidents
NFPA 1006 Standard for Technical Rescuer Professional Qualifications
NFPA 1983 Standard on Life Safety Rope and Equipment for Emergency Services
ANSI Z359.1 Safety Requirements for Personal Fall Arrest Systems, Subsystems, and Components
CSA Z259.10 Full Body Harnesses
FIRE FIGHTERS GUIDANCE NOTE # 6-6

ISSUE: FLASHOVER

Flashover occurs when flammable gases are created under the right combustion conditions and the room temperature exceeds the ignition point of the gases. Flashover can produce fast moving flames with temperatures in excess of 1100 degrees Fahrenheit.

Rollover is often confused with flashover. Rollover is far less dangerous condition than flashover because the resulting incomplete combustion produces slower moving flames. Flashes of flame that can be seen at the ceiling level or at the top of an open doorway or window are indications of rollover.

If no action is taken, rollover will proceed to flashover.

Pre-flashover signs include:

- the room gets hot very quickly;
- a rapid inversion of the smoke layer from the ceiling to the floor (i.e. the smoke suddenly drops to floor level engulfing firefighters);
- roll-over in some cases; and
- temperatures at waist height that are hot enough to melt a visor.

To prevent injuries the following precautions should be followed:

- get down as low as possible;
- get out as quickly as you can using any, safe exit (e.g. doors, windows); and
- when the smoke drops immediately discharge water at the ceiling to cool the gases (Note: this action may result in steam burns but is preferable to burns from a flashover).

The best way to prevent flashover is by creating adequate vertical or horizontal ventilation.
FIRE FIGHTERS GUIDANCE NOTE # 6-7

ISSUE:  DRIVING SKILLS FOR EMERGENCY APPARATUS RESPONSE

Firefighters are called upon to drive a variety of Fire Department vehicles under both routine and emergency response conditions. These vehicles can range from off-road vehicles such as all-terrain vehicles (ATVs), utility vehicles (UTVs) and snowmobiles, to automobiles and heavy trucks; each vehicle has different control and handling characteristics. To prevent injury to firefighters and to reduce the chance of vehicle accidents, firefighters should receive training on every vehicle they are expected to drive and operate in the course of their duties and should also receive training in the subjects as noted below.

It is recommended that following theoretical training, firefighters should receive practical training in the defensive driving skills as outlined:

- the effect of weight and speed on braking and stopping distances
- the effects of centrifugal force on vehicles during turning
- for off-road vehicles, the effects of slope on roll over
- for off-road vehicles, fire department limitations on terrain to be traversed
- the effect of inertia and weight distribution related to changing the heading or direction of a vehicle
- the effect of tire friction related to driving traction, braking traction and cornering traction
- the effect of various weather conditions on the braking, steering control and stopping distances and the ability of workers to recognize and adapt to these conditions
- driving strategies to prevent accidents should include the following skills:
  - a serpentine exercise – change of direction
  - an evasive exercise – steering around an object
  - controlled braking exercise
  - backing exercise
  - off-road vehicles should be driven on terrain conditions that may be encountered in emergency situations.

Where practical, firefighters should receive further training in the following:

- skid control
- off-road recovery exercise.
Employers should allow sufficient time when scheduling the practical driving skills portion of the course to enable employees to master their defensive driving skills.

Driving of aerial devices and tankers requires additional training due to the size and weight of these units.

Employers should consider implementing a “graduated program” for all employees who are required to drive heavier-than-normal vehicles or specialized vehicles. By implementing a “graduated program”, those employees who will be operating various types of apparatus can be given the appropriate training specific to the apparatus.

Where vehicles are equipped with seat belts, they should be used in accordance with the manufacturers’ instructions and the requirements of the Highway Traffic Act (HTA).

The HTA, Reg. 610 Safety Helmets made under the HTA, Reg. 863 made under the Off-Road Vehicles Act, and Reg. 804 made under the Motorized Snow Vehicles Act should be consulted with respect to helmet requirements. Helmets should be used in accordance with the manufacturers’ instructions.

Reference: GN # 1-1 Fire Truck Occupant Safety
GN # 6-25 Safety Considerations for Fire Department Tankers
FIRE FIGHTERS GUIDANCE NOTE # 6-8

ISSUE: AERIAL LADDER OPERATIONS DURING LIGHTNING STORMS

There is a potential for aerial devices to attract a lightning strike during lightning storms. Aerials, because of their size and mass may act as lightning rods whether their aerials are raised or not. However, the chance of lightning striking an aerial increases if the ladder is raised. As well, even a close lightning strike may induce a current into the ladder by the conduction of electricity through the aerial to ground through hose lines, waterways and even tires. Steel belted radials are especially susceptible.

When lightning storm activity is visible or expected in the immediate area of an incident requiring the use of an aerial device, extreme caution should be exercised. Aerial operations should be suspended and aerials bedded if possible until the storm passes. Aerial operators should not assume they are protected on aerial turntables or isolating platforms. Be aware that a strike to an aerial or in the vicinity of an aerial may also spread the electricity charge to a supply pumper through the charged hose. Therefore, appropriate precautions should be taken to protect the pump operator as well.

Fire departments, having the capabilities, should monitor current weather information during incidents that may coincide with electrical storm activity. Where an incident commander is aware that there is the likelihood of lightning in the immediate area of an incident, all aerial operations should be suspended until the storm passes, where possible.

Note: That for a general rule, the “Immediate Area” can be considered 5 kilometres.
FIRE FIGHTERS GUIDANCE NOTE # 6-9

ISSUE: HAZARDOUS MATERIALS RESPONSE

Fire departments providing hazardous materials (Haz-Mat) response should meet the requirements of NFPA 472 (2002 edition).

Fire departments should evaluate their hazardous materials response capability and operational response level(s). This will help to ensure firefighters are not responding to situations where their training or equipment may be inadequate as outlined in NFPA 472 (2002 edition). Fire Departments should also take the following recommendations into consideration:

- Fire departments should have the necessary documentation for both the theoretical and practical training that corresponds to their required level of response. (See Guidance Notes #7-2 Training Requirements and #7-3 Documentation of Training Plus Daily Training Report)

- All firefighters should be trained to the awareness level for Haz-Mat Response as per the requirements NFPA 472 (2002 edition).

- Firefighters required to perform at either the Operational or Technician level of Haz-Mat should be trained and equipped to these levels as per NFPA 472 (2002 edition).

- Fire departments should provide appropriate supervision, resources, and the required equipment that corresponds to the required level of response, as determined by the municipality’s Establishing and Regulating By-law, and in accordance to NFPA 472 (2002 edition).
FIRE FIGHTERS GUIDANCE NOTE # 6-10

ISSUE: HIGHWAY TRAFFIC CONTROL

Firefighters performing firefighting and rescue extrications on highways and roadways are in risk of serious injury. It is important to provide emergency workers with as safe a working area as reasonably possible. Inter-departmental responses (Mutual Aid/ Automatic Aid) should be pre-planned to deal with traffic issues in a consistent manner.

To ensure firefighter safety, the following precautions should be taken:

- Firefighters required to use traffic control stop or slow signs should receive the appropriate training to do so.
- Employers need to develop and communicate to firefighters a written guideline on safety precautions to follow when exposed to potential hazards from vehicular traffic.
- The Incident Commander is responsible for implementing department guidelines to establish a safe working area.
- The safe working area should be established in co-ordination with the police Incident Commander whenever possible.
- Leave red emergency lights on in accordance with Part X of the Highway Traffic Act (HTA).

Highways with speeds greater than 90 km/h:

- On major highways, particularly 400 series, highway emergency vehicles should block one more lane of traffic than needed during emergency operations. It is recommended that safety cones should not be deployed on highways with speed limits greater than 90 km/h.
- To protect the safety of firefighters, firefighters are not to use a “traffic control stop or slow sign” outlined in Part X subsection 146.1 of the HTA on highways with speed limits greater than 90 km/h. The Ministry of Transportation has advised that the traffic control stop or slow sign is not permitted to be used on any roadway where the posted speed limit is greater than 90 km/h.
- Emergency vehicles (e.g. pumpers, tankers, aerials) being used as “blockers” should be placed at least 30 metres from the actual working area with the front wheels turned, so as to direct the vehicle off the roadway and not forward into the safety zone if hit from behind.
- Personnel are expected to stay behind the blocker apparatus and within the safety zone provided.
• Never cross high-speed traffic lanes on foot for any purpose. Reposition apparatus instead, or call for additional apparatus that can respond to the proper location.

• Firefighters should exit fire apparatus on the untravelled side of traffic flow, whenever possible.

Roadways with **speeds of 90 km/h or less**:  

• Fire departments may choose to use HTA Part X subsection 146.1 to allow firefighters to use traffic control stop or slow signs to direct traffic on roadways with speeds of 90 km/h or less. Signs provided must meet the criteria outlined in Regulation 615 Signs made under the HTA.

• Firefighters who are directing traffic using a traffic control stop or slow sign are not to perform any other work while directing traffic.

• When an incident is of a nature that firefighters will be laying hose or otherwise working on the roadway, apparatus should be positioned to provide a safe work zone for the firefighters, until police or the road authority assume traffic control.

• Where apparatus will be parked without protection of a “blocker”, vehicle traffic cones should be used by apparatus operators to control traffic flow around the parked vehicle, giving enough room for a walkable safety zone around the vehicle.

The following additional issues should be considered when developing SOPs/OGs:

• The police service responding to the serviced area should be consulted in the development of departmental procedures.

• Delaying traffic unnecessarily can result in secondary incidents; therefore firefighters should move non-emergency operations off the travelled portion of highways as soon as possible.

• In prolonged incidents, it is recommended that the local road authority be contacted to provide “blockers”.

**Note:** Section 134(2) of the HTA permits only police officers to close a highway.

**High Visibility Safety Apparel**

High visibility safety apparel should be worn by firefighters who may be endangered by vehicular traffic. The firefighter(s) who are controlling traffic by the use of traffic control stop or slow signs are required to wear high visibility safety apparel while performing this work. Personnel working within a safe zone established by blocker apparatus or police do not require vests. Personnel wearing self contained breathing apparatus or other specialized PPE such as
Hazmat suits do not require safety vests but must be protected within a safe zone established by blocker apparatus or police.

Note: Most bunker gear does not meet the reflectivity performance requirements of the Canadian Standards Association (CSA) Standard Z96-09 High-Visibility Safety Apparel.

The Ministry of Labour accepts high visibility safety apparel that meets the performance requirements under the CSA Z96-09 standard for both the background materials and the stripes/bands. The following classes and colours of high visibility safety apparel comply with CSA Z96-09:

**CLASSES**

**Daytime**
CSA Z96-09 Class 2, Level 2 (minimum)

**Night time**
CSA Z96-09 Class 2, Level 2 (minimum) and horizontal stripes/bands that encircle both arms and both legs not less than 5 centimetres away from the wrist or ankle or Class 3, Level 2.

**Special Cases:**
Fire Resistant Applications (Only) CSA Z96-09 Level FR

**COLOURS**

**Fluorescent Background Material**
Fluorescent yellow-green
Fluorescent orange-red
Fluorescent red

**Bright Background Material**
Bright yellow-green
Bright orange-red

**Label Requirements**

All high visibility CSA Z96-09 safety apparel must comply with the labelling requirements under the standard.
Ministry of Labour Inspectors can check the label to ensure that the apparel complies with the above class and level performance requirements.

**NOTE:**

High Visibility garments that comply with the previous CSA Z96 standard are considered acceptable if in good condition, however, when old high visibility garments are replaced, they should be replaced with high visibility garments that meet the current CSA Z96-09 standard.
FIRE FIGHTERS GUIDANCE NOTE # 6-11

ISSUE: RAPID INTERVENTION TEAMS (RESCUE)

The employer should provide written operational guidelines for establishing rapid intervention crews/teams of at least two firefighters to rescue firefighters in circumstances where there is the potential to become lost or trapped. The potential to become lost or trapped can occur at emergencies such as interior structural fires, confined space rescues, high angle rescues etc.

The Rapid Intervention Teams (R.I.T.) can either be:

- On-scene firefighters designated and dedicated to rapid intervention crews, or;
- On-scene firefighters performing other functions, but ready to deploy as rapid intervention teams if necessary.

Operational Procedures developed by the employer should ensure the following key elements are implemented:

- Rapid intervention teams shall be fully equipped with the appropriate protective clothing, portable radios, protective equipment, SCBA, and any specialized equipment that may be needed considering the specifics of the operation.

- Based on resources at hand it may be necessary that emergency rescue activities take place before a R.I.T. has assembled. Such instances should be reported in writing to the Fire Chief and the circumstances forwarded to the local Joint Health and Safety Committee or Health and Safety Representative to be reviewed.

- If a R.I.T. is to be assembled from on-scene firefighters performing other functions, a number of additional key elements must be addressed in the Operational Procedure such as:
  - Personnel must know that they have been designated as the R.I.T.
  - They cannot be performing functions that require the use of their S.C.B.A. air supply.
  - The Incident Commander or other Sector Officers cannot be designated as the R.I.T.
- R.I.T.'s shall be implemented as part of the Incident Command and Accountability systems.
- If a firefighter becomes lost, a Personnel Accountability Report (PAR) must be conducted immediately, and the R.I.T must be alerted.
- Once a R.I.T. is deployed another R.I.T. team should be implemented for their protection if resources allow.
- A R.I.T. is not required for every pair/crew making entry into a hazardous area, but more than one R.I.T. may be required if resources are available depending on the size and geographical layout of the incident.
FIRE FIGHTERS GUIDANCE NOTE # 6-12

ISSUE: REHABILITATION DURING EMERGENCY OPERATIONS

Fire Departments should develop SOPs/OGs that provide for rehabilitation within the scope of resources available to them. Rehabilitation is required whenever firefighters are exposed to extremes of temperature or work activity.

Typical rehabilitation considerations are (but are not limited to):

a) Moving fatigued and unassigned personnel away from the hazardous area of the incident before drinking replacement fluids or providing food. Basic hand washing for the purpose of decontamination should be conducted before eating and drinking. Drinks containing caffeine are not recommended.

b) Ensuring that personnel are provided heated shelter in extreme cold and removed from direct sunlight in high heat.

c) All personnel are encouraged to re-hydrate throughout the incident. The rule of thumb is approximately 8-13 ounces of replacement fluids during rehab. Regardless of environmental conditions, 500 millilitres (16 ounces) of replacement fluids should be consumed during the final rehabilitation period.

d) Active cooling may be accomplished through misting or through forearm immersion in cool water when ambient outdoor temperature is above 25 degrees Celsius. Fire departments should investigate the best method for their department.

e) Following the first rehab session, personnel returning to work need an additional cooling session following each subsequent cylinder of air. For extended work periods, rotation between lighter and heavier work is strongly recommended.

f) Where available, EMS personnel should provide medical monitoring, however, heart rate should not be the sole indicator for the extent of heat strain. **Note:** Elevated or irregular heart rate may be an indication of cardiovascular stress.

Reference:
“Incident Commander’s Guide: Continuous Exposure Times for Firefighters”
www.wsib.on.ca/wsib/wsibobj.nsf/LookupFiles/DownloadableFileHeatWheel/$File/HEATWHEEL2_small.pdf
www.mhsao.com/HeatStress_frame.html
FIREFIGHTERS GUIDANCE NOTE # 6-13

ISSUE: VIOLENCE AND HARASSMENT IN THE WORKPLACE

(Previously known as DEALING WITH POTENTIALLY VIOLENT SITUATIONS)

Firefighters may encounter a variety of situations where they may be exposed to violence while performing their work duties.

Bill 168 amended the Occupational Health and Safety Act (OHSA) and came into effect on June 15, 2010. These changes to the OHSA serve to strengthen protections for workers from workplace violence as well as addressing workplace harassment.

Definitions of “workplace violence” and “workplace harassment” are included in the OHSA as follows:

“Workplace violence” means,
(a) the exercise of physical force by a person against a worker, in a workplace, that causes or could cause physical injury to the worker,
(b) an attempt to exercise physical force against a worker, in a workplace, that could cause physical injury to the worker,
(c) a statement or behaviour that it is reasonable for a worker to interpret as a threat to exercise physical force against the worker, in a workplace, that could cause physical injury to the worker.

“Workplace harassment” means,
Engaging in a course of vexatious comment or conduct against a worker in a workplace that is known or ought reasonably to be known to be unwelcome.

Employers are required to:
• Prepare policies with respect to workplace violence and workplace harassment.
• Review the policies as often as necessary, but at least annually.
• Post the written policies at a conspicuous place in the workplace (where the number of employees regularly employed at the workplace is greater than five).
• Develop and maintain programs to implement the policies.
• Provide information and instruction to workers on the contents of these policies and programs.
• Assess the risks of workplace violence that may arise from the nature of the workplace, the type of work, or the conditions of work. Measures and procedures to control these risks are to be included in the workplace violence program. Employers must advise the Joint Health and Safety Committee (JHSC) or Health and Safety Representative, if any, of the assessment results. If the assessment is in writing, the employer must provide a copy to the JHSC or the Health and Safety Representative.
Both workplace violence and workplace harassment programs are to include measures and procedures for workers to report incidents of workplace violence/harassment and set out how the employer will investigate and deal with incidents or complaints.

Employers may wish to consult with the workplace’s JHSC or Health and Safety Representative when developing workplace violence and workplace harassment policies and programs (Note: this is not a requirement of the OHSA).

Employers who are aware, or ought reasonably to be aware, that domestic violence that would likely expose a worker to physical injury may occur in the workplace, must take every precaution reasonable in the circumstances for the protection of the worker.

An SOP/OG for dealing with potentially violent situations should address the following:

- The responsibilities of the call taker to obtain accurate information
- The method to ensure timely and accurate information exchange with other relevant agencies (police, ambulance, 911, etc.)
- Ensure responding crews have all the available information
- Measures and procedures to summon immediate assistance
- Under what circumstances crews should vacate or stay clear of the incident until police arrive and advise that it is safe to enter
- Establishment of emergency codes for use by responding personnel so as to not worsen the situation
- Measures and procedures for workers to report incidents to the employer or supervisor
- How the employer will investigate and deal with incidents or complaints
- Procedures to assist Fire Prevention Officers who may encounter potentially violent situations in the course of their duties.

The OHSA should be consulted for the specific requirements of the legislation.

It should be stressed that Canada’s Criminal Code deals with matters such as violent acts, threats and behaviours such as stalking. The police should be contacted in these situations. It should also be noted that harassment may also be a matter that falls under the Ontario Human Rights Code.

Reference:
Occupational Health and Safety Act
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm
Workplace Violence and Harassment: Understanding the Law (Ministry of Labour Health and Safety Guideline)
Preventing Workplace Violence and Workplace Harassment (Ministry of Labour Fact Sheet #2)
FIRE FIGHTERS GUIDANCE NOTE # 6-14

ISSUE: SAFE ROOF OPERATIONS

The following information will assist the safety of personnel working on roofs during an incident. Fire Departments should develop SOPs/OGs for their operations that provide written instruction and training that address these concepts:

- Provide alternate means of emergency escape to the initial route of access
- Appoint a Roof Sector Officer under the Incident Management System
- Sound the path of travel when operating on a roof
- Conduct a risk assessment that could include: determination of the type of roof construction, location of fire and the length of time the structure has been burning as it impacts on building integrity when considering committing personnel to the roof sector
- Based on the risk assessment, appropriate PPE and equipment should be provided to individuals assigned to the roof sector
- Reasonable precautions should be taken where firefighters are at risk of falling off or falling through a roof during emergency operations.
FIRE FIGHTERS GUIDANCE NOTE # 6-15

ISSUE: RESPONDING TO CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR (CBRN) TERRORISM INCIDENTS

There exists a real potential for firefighters to be called upon, to respond to Chemical, Biological, Radiological, and Nuclear (CBRN) Terrorism Incidents. Even though these incidents may occur infrequently there is a need for Fire Departments to take deliberate action to ensure firefighter safety is addressed.

The following details should be considered:

- At a minimum all firefighters should receive awareness training to recognize a CBRN terrorism incident and to implement self-protective measures.

- SOP/OG's should identify what role firefighters are expected to fulfill in an emergency response to a potential CBRN terrorism incident. An operations level of response should only be contemplated if the Municipality has provided the mandate, resources and training for such.

- Incident commanders should have access to a contact list of Municipal, Provincial and Federal Government resources that can assist your municipality with the crisis and consequence management of a CBRN terrorism incident.

Pre-planning for CBRN terrorism incidents should contemplate a joint response by Fire, Police, Ambulance, Medical Officer of Health, local Hospitals, Public Transportation, and Works Departments.
FIRE FIGHTERS GUIDANCE NOTE # 6-16

ISSUE: MACHINERY/ELECTRICAL LOCKOUT DURING EMERGENCY RESPONSE

Fire Departments may be called upon to perform rescue to entrapped person(s) in various forms of industrial machinery, elevators, etc.

For the purpose of this Guidance Note, the term “lockout” refers to the methods, devices, and procedures for preventing the sudden and uncontrolled release of energy from a system, machine, or piece of equipment. Since energy is what a lockout system attempts to eliminate or control, it is important to identify all active potential sources of energy associated with the piece of equipment involved.

Main energy sources provide power to a system such as electricity, pneumatics, or hydraulics. Stored or secondary energy stays in the system after the main source is turned off. Stored energy includes electricity in batteries and capacitors, volatile chemicals in piping systems or pistons that move back and forth after the equipment’s power supply is turned off.

The following details should be considered while performing these operations:

- Fire Departments should include lockout procedures in their SOPs/OGs
- Ensure that training in lockout procedures is given to those personnel that will perform rescue in any industrial machinery or energized electrical equipment
- Are personnel on site who possess a greater knowledge of the machinery, and who can assist in locating shut-offs and disassembly of the machine?
- Isolate the energy supply by locating power sources and ensure that lockouts are performed. In energized electrical equipment, locate the main line and disconnect and perform a lockout. In pneumatic/hydraulic equipment, locate line shut-offs and perform lockout. In flowing liquid/solid applications, ensure that the block-outs are performed.
- Eliminate or neutralize energy reactors by use of chocks, wedges, blocking devices or elimination of secondary power where necessary.
- Assign personnel with a communications source (radio) to stand-by lockouts, to ensure that machinery power supply is not inadvertently turned back on.
FIRE FIGHTERS GUIDANCE NOTE # 6-17

ISSUE: CLANDESTINE DRUG LABS/MARIJUANA GROW HOUSES

As a result of the number of Clandestine Drug Labs and Marijuana Grow Houses in existence today, there is an increasing risk of firefighters encountering these situations during fire fighting duties. Clandestine Drug Labs are makeshift laboratories for manufacturing controlled substances such as methamphetamine (speed), PCP (angel dust) and designer drugs (synthetics). Once identified these situations should be treated as crime scenes.

The primary concerns for firefighters entering Marijuana Grow Houses or Clandestine Drug Labs are electrocution, propane/natural gas/flammable liquid explosions, structural collapse, chemical hazards, toxic and corrosive atmospheric hazards, improperly contained toxic chemicals and booby traps.

Fire departments should provide adequate training to all personnel involved in Clandestine Drug Lab/Marijuana Grow House responses.

The following information should be included in your department’s SOPs/OGs:

- Identifiers of potential Clandestine Drug Lab/Marijuana Grow Houses;
- When a Marijuana Grow House/Clandestine Drug Lab is discovered during fire fighting operations, exit the area as soon as practical, notify police, ambulance, hydro and all other appropriate agencies;
- What situations should be identified as Hazardous Material Incidents;
- Appropriate PPE shall be worn;
- Do not attempt to shut off electricity yourself to the Marijuana Grow House (do not shut hydro off at a Clandestine Drug Lab due to possible reactions and the type of operations) or touch any equipment. Contact a hydro company;
- The hydro company cannot guarantee the power has been shut off even after disconnecting the service. Many grow houses will have the hydro by-passed. Caution must still be exercised when working at this incident;
- **If rescue is not required** do not enter a Clandestine Drug Lab/Marijuana Grow House until deemed safe by all responding emergency agencies. Your first responsibilities should be securing the area, protect yourselves and the public, stay up wind and protect exposures from a safe distance;

- Air quality testing should be considered prior to making entry;

- Identify the factors that contribute to the hazards of a Clandestine Drug Lab/Marijuana Grow House including chemicals, booby-traps, hydro etc.;

- All personnel involved in a Clandestine Drug Lab/Marijuana Grow House should be decontaminated if deemed necessary;

- Coordinate and develop protocol with Local Police, Utility companies and other agencies.
FIRE FIGHTERS GUIDANCE NOTE # 6-18

ISSUE: UNPROTECTED LIGHTWEIGHT BUILDING CONSTRUCTION

Firefighter fatalities and injuries have occurred as the result of rapid structural failure. Buildings constructed using lightweight materials that are not sufficiently protected by sprinklers or effective non-combustible structural protection systems may collapse much sooner than expected and without the warning signs that are commonly present in fires that involve legacy construction. Lightweight construction is a common present day construction type.

Incident Commanders and firefighters should have knowledge of how unprotected lightweight trusses, fastening systems, wooden “I” beams, lightweight steel frame construction and other engineered construction components are quickly compromised when exposed to heat and flame.

Incident Commanders should:

- Consider the type of construction, the presence of protective sprinkler systems, and to what extent the structure may have been damaged by fire before initiating firefighting efforts and continually evaluate the risks during operations in buildings that contain unprotected lightweight construction;
- Assume that unprotected lightweight construction is present, if unable to determine the type of construction in a building involved in fire;
- Consider employing defensive fire attack strategies where no threat to human life exists within buildings that contain unprotected lightweight construction.

The following items should be included in a review of fire department SOPs/OGs:

- The special hazards associated with buildings built with unprotected lightweight construction. Firefighter safety and the likelihood of an early unpredictable collapse should be stressed;
- Use a thermal imaging camera, if available, to help locate fires burning below or within floor systems; but recognize that the camera cannot be relied upon to assess the strength or safety of the floor. Firefighters should be trained on the use of thermal imaging cameras, including limitations and difficulties in detecting fire burning below floor systems;
- Firefighters should use extreme caution when operating on or under an unprotected lightweight truss roof or floor and firefighters should evacuate as soon as it is determined that the unprotected trusses are exposed to fire;
• Develop and practice regularly, emergency warning procedures for evacuating a building in danger of collapse.
FIRE FIGHTERS GUIDANCE NOTE # 6-19

ISSUE: HYBRID/ELECTRIC and ELECTRIC VEHICLE SAFETY

Hybrid/Electric vehicles are automobiles powered by a combination of internal combustion and electric motors. The electric motors are powered by high voltage battery packs. Certain Hybrid/Electric or Electric models are powered by an internal combustion generator when the battery voltage is down.

Although manufacturers build into their vehicles a number of safety features and devices to prevent accidental shock to the driving public, the Hybrid/Electric vehicle’s high voltage system can pose a hazard to the safety of firefighters in an emergency situation.

Fire Departments should conduct a risk hazard analysis and take appropriate action in developing SOPs/OGs and training for the safety of their firefighters.

Common fire fighting procedures will extinguish Hybrid/Electric and Electric vehicle fires.

The following are important safety considerations for Hybrid/Electric and Electric vehicles:

- Do not cut, disconnect or handle the high voltage cable that is color-coded orange;
- Be aware that high voltage cable commonly runs under the vehicle chassis. Firefighters need to be aware of this hazard when lifting or stabilizing Hybrid/Electric and Electric vehicles;
- High voltage systems need to be shut down by any of the several means provided by manufacturers before firefighters enter damaged hybrid/electric or electric vehicles, or before starting extrication procedures. This also prevents accidental movement of the vehicle because there may be no engine noise even though a hybrid/electric or electric vehicle is powered on;
- Extrication procedures may vary from manufacturer to manufacturer;
- Markings to indicate hybrid/electric or electric vehicles vary from manufacturer to manufacturer.

Ontario Fire Marshal Communiqué 2011-04
FIRE FIGHTERS GUIDANCE NOTE # 6-20

ISSUE: ELECTRICAL HAZARDS IN RESCUE AND FIRE SITUATIONS

Firefighters may be exposed to the risk of electrocution and/or serious injury during response to:

- Hydro utility equipment that has been damaged by collision, failed or caught fire i.e. vehicle collision with hydro pole, hydro transformer explosion, etc and,
- During response to structural fires where fire has compromised the electrical power supply.

The employer should take every reasonable precaution to prevent injury by adopting the practices published in the Hydro One and the Municipal Health and Safety Association handbook:


This handbook is available from the Municipal Health and Safety Association at www.mhsao.com.
FIRE FIGHTERS GUIDANCE NOTE # 6-21

ISSUE: AIRCRAFT FIRE FIGHTING HAZARDS

In order to safely conduct aircraft rescue and fire fighting operations, fire fighters should be trained to the level of response as defined by their local Council or Board. The level of response and specific Operating Guidelines should be established. Fire fighters should be knowledgeable about the various aircraft systems and their associated hazards.

Some hazards with crash scenes could include:

- control of access to the airport site
- types of materials of aircrafts – there are three types
  i) simple composite (fiberglass)
  ii) advanced aerospace materials (boron\epoxy, carbon\epoxy, depleted uranium)
  iii) radar absorbent materials (stealth technology)

Note: Composite materials become unsafe when the bonding material burns away during a fire – the composite fibres become exposed and free to contaminate living organisms.

- Jet fuels – there are three basic types: Jet A, Jet B, and Avgas. Jet A is less flammable than Avgas with a flash point of 38C and a flame spread rate of 33 meters\minute (100 ft.\min.) Avgas is very volatile, having a flash point of -45C and a flame spread of approximately 264 meters\minute (800 ft.\min.) They are skin irritants and are heavier than air and will collect in low lying areas.

Hazards associated with Airport response could include:

- propeller hazards
- helicopter rotors
• jet engine hazards
• landing gear hazards
• cargo hazards – could contain hazardous materials – locate cargo manifest usually on or near cockpit door

References:
• IFSTA Aircraft and Rescue Firefighting – 4th edition
• NTSB – National Transportation Safety Board
• ARFFWG – Aircraft and Rescue Firefighting Working Group
FIRE FIGHTERS GUIDANCE NOTE # 6-22

ISSUE: VENTILATION SAWS

Ventilation is an important component of conducting safe and effective fire fighting in structures. Coordinating ventilation and fire attack streams can result in less danger to firefighters and occupants and provide quicker fire control.

Fire departments use various types and makes of power saws to open roofs for ventilation. The safe use of these saws requires knowledge and training on the operation of this equipment.

Ventilation saws are commonly divided into two types:

- Rotary or Circular saws which use a variety of circular blades to cut wood, steel and concrete.
- Chain Saws – which are now available with different chains, blades and special attachments designed specifically for fire ventilation work.

Saws include models with improved safety and operating features for fire department use that should be considered when buying new saws.

SOP’s/OG’s on ventilation saws should include the following:

- Proper maintenance and servicing of saws as per the manufacturers operating manual including fueling, oil mixes, starting, stopping, checking chain brake, chain adjustment and cleaning.
- Start and run the saw briefly on the ground and then shut off, before it is sent aloft.
- Most new ventilation chain saws have an adjustable depth gauge that increases safety and can be set to minimize cutting of rafters.
- Follow safety procedures for working on roofs.
- Wear full protective equipment including eye protection if not wearing SCBA.
- Have a guide to watch where the operator is going and clear the path of obstructions.
- Keep all other firefighters clear of the cutting operation.
• Departments should ensure that firefighters are trained how to safely operate the saws used by their department and maintain records of the training.

• Where a department is using chain saws for cutting trees and work associated with forest fire fighting additional training qualifications for use of chain saws in logging operations may be required.

For additional information refer to:

• IFSTA Manuals
• Fire Service Ventilation
• Forcible Entry
• Essentials

Guidance Note #6 -14 Safe Roof Operations
FIRE FIGHTERS GUIDANCE NOTE # 6-23

ISSUE: SAFETY DURING SALVAGE AND OVERHAUL

Following extinguishment of fires, incomplete combustion will create a hazardous atmosphere. This places personnel involved in operations such as salvage and overhaul at risk of exposure to these contaminated atmospheres.

Salvage and overhaul present many risks to firefighters. The most common risk would be respiratory exposure. Toxic levels from the fire may be at their worst during the smoldering phase. Personal protective equipment, including respiratory protection, should be worn during this phase of firefighting.

There are many other risks that should be considered when performing these operations:

- Structural integrity of the building
- Exposure to carcinogens such as asbestos
- Sprains and strains
- Physical injuries
- Contamination through inhalation, ingestion, sharps, contact with contaminants, toxins, or potential carcinogens
- Gas and electricity should be isolated if at all possible
- Ventilation should be ongoing until salvage and overhaul activities have been completed
- Physical stress should be monitored and rehab should occur in accordance with GN # 6-12 Rehabilitation During Emergency Operations.

Monitoring of all risks should be maintained during all of these operations.
FIRE FIGHTERS GUIDANCE NOTE # 6-24

ISSUE: BUILDING COLLAPSE DURING FIRE SITUATIONS

Interior fire fighting and rescue situations are amongst the most dangerous operations that fire fighters will work in. All fire service personnel who may be involved in either offensive or defensive operations should have an understanding of building construction and a high level of awareness regarding the potential for building collapse.

Risk assessment criteria should include:

- Building use and contents; are occupants at risk and is search and rescue required?
- Is this a contents only fire or is the building structure involved?
- Building construction type and potential hazards of each type.
- Existence and working order of fire protection systems.
- Length of time of fire involvement and fire load (materials burning).
- Voids that may provide undetected paths for fire spread such as drop ceilings, balloon construction, duct and conveyor systems, horizontal open joists, and “cockloft” area.
- Impact of heat on unprotected steel columns, cables, joists, nail plates (gussets), etc.
- Impact of content load, weight of fire fighting water, snow loads, etc. on building integrity.
- Buildings under construction/alteration or in a dilapidated or abandoned condition pose extra hazards.
- Indications of building weakness or pending collapse.
- Probable collapse sequence should it occur.

Protective measures should include:

- Pre-fire plans where available may provide a critical risk assessment and decision making information for Incident Commanders.
- Identification and maintenance of escape paths during interior operations.
- Establishment of collapse/safety zones.
- Standardized evacuation signal.
- Travel distance into building vs. available air supply.
Reference to other Guidance Notes including:

- GN #2-1 (Incident Command);
- GN #2-2 (Buddy System);
- GN #2-4 (Incident Safety Officer);
- GN #4-4 (Personal Alert Safety Systems);
- GN #5-1 (Firefighter Accountability and Entry Control);
- GN #6-11 (Rapid Intervention Teams); and
- GN #6-18 (Lightweight Building Construction).
ISSUE: SAFETY CONSIDERATIONS FOR FIRE DEPARTMENT TANKERS

Many fire departments throughout Ontario depend on tankers to supply water for fire suppression. Safe operation of tankers can be more demanding than other fire apparatus.

The causes of tanker collisions have been identified as resulting from the following factors:

- **Human Factors** – insufficient training, lack of driver experience, overconfidence, excessive speed, inability to recognize danger signs, lack of or failure to follow SOPs/OGs, disobeying traffic laws, failure to yield right-of-way by civilian drivers.
- **Apparatus Design Factors** – Weight of apparatus, age, high center of gravity, improper design or modification, retro-fitting non-fire apparatus, liquid surge, poor maintenance.
- **Driving Surface Factors** – poor road design not intended to support the weight or stress of fire apparatus, severe grades, sharp curves, unimproved road surfaces, adverse weather conditions, soft road shoulders, limited weight capacity.
- **Emergency Scene Factors** – emergency scene congestion, oncoming traffic at the scene, maneuvering at water shuttle dump and fill sites.

To minimize the danger of accidents with tankers, fire departments should develop SOPs/OG that consider the following recommended practices:

- Operate the tanker at a safe and reasonable speed keeping in mind that partial water tank loads can shift creating significant instability during directional changes or braking.
- The cautionary speed signs that accompany road signs indicating curves in the road should be considered the maximum speed for a tanker driving on these curves.
- Know the weight of your apparatus.
- Keep all of the wheels on the travelled road surfaces if possible keeping in mind that driving on shoulders can create tanker instability.
- Provide training for tanker drivers under various road conditions.
- Tankers should be equipped with back-up alarms and lighting that activates when reversing to illuminate the rear area.
- Be familiar with your response district and the roads within it and whenever possible, avoid poorly constructed or unpaved roads.
- When possible, have at least one firefighter accompany the driver of the tanker.

Other References:
- GN #1-3 Backing Fire Apparatus
- GN #6-2 Fire Fighting Near Water
- GN #6-7 Driving Skills for Emergency Apparatus Response
- GN #6-10 Highway Traffic Control
FIRE FIGHTERS GUIDANCE NOTE # 6-26

ISSUE: STRUCTURAL FIREFIGHTING – FIRE STREAMS AND VENTILATION

Structural firefighting is very dangerous work. Extinguishing the fire quickly is the most effective way of reducing the dangers encountered on the fireground. Proper use of fire streams and coordinated ventilation are key components to improving safety and effectiveness on the fireground.

Firefighters and officers should understand Critical Flow Rates (the minimum flow in litres or gallons per minute required to extinguish a given size fire) and the effects of nozzle stream patterns when determining the type, size and number of lines required to control the fire as quickly as possible.

Fire departments should establish minimum flow rates for residential fires and for commercial building fires. Commonly accepted critical flow rates for residential fires are 570 lpm (150 usgpm) and 950 lpm (250 usgpm) for commercial building fires. Nozzles with lower reaction forces at higher flow rates improve the safety of firefighters by reducing the workload and stress during the high demands of interior firefighting.

When interior firefighting takes place, a direct attack should be emphasized in place of indirect or combination attack, when possible. Improper use of fog patterns during an interior attack can place firefighters in great danger as the result of large volumes of air forced into the fire area, creation of excessive amounts of steam and upset of the thermal balance that can reduce visibility, cause steam burns or result in flashover.

Ventilation coordinated with fire attack is also a vital component of safe fire fighting and must be considered as an essential part of a safe interior fire attack.

Fire department training programs on structural firefighting should include components on critical flow rates, nozzle pressures, and reaction forces, the possible dangers of using fog streams during interior attack and the importance of coordinated ventilation practices.

Prior to participating in live fire training and fire suppression, fire personnel should receive training on the use and application of fire streams and the need for coordinating ventilation of fires with the fire attack.
FIRE FIGHTERS GUIDANCE NOTE # 6-27

ISSUE: FIRES IN INDUSTRIAL DUST COLLECTORS, HOPPERS and BINS

Fire departments should identify locations of industrial dust collectors, hoppers and bins in their response area in order to adequately pre-plan for emergency situations.

Industrial dust collectors, hoppers and bins that are used in woodworking, furniture manufacturing, flour mills and dry food processing mills may contain combustible dusts such as:

- sawdust,
- metal shavings,
- paper and plastic dust,
- grains and flour, or
- other types of milling or agricultural products.

Explosive conditions may arise when there is:

- an ignition source and/or movement of air into the interior of the dust collector, hopper or bin;
- a sudden movement of materials causing dust to be suspended in air;
- a smouldering fire in the contents,
- a build up of static electricity in equipment used to transfer, transport or move product from one container to another, or
- as a result of first responders or firefighters attempting to clear materials to get to a source of ignition.

Firefighters should exercise extreme caution when responding to these incidents and, where possible, avoid entry into the collector, hopper, or bin to extinguish fires.

Incident Command should identify the product, hazards and the extent and degree to which fire and heat are transferred within the container and the surrounding duct work or buildings. If available, thermal imaging cameras should be used for this purpose.

An adequate water supply is to be established before commencing any suppression operations and, depending on products involved, firefighting foam may be a consideration. When applying hose streams, caution should be exercised to minimize unwanted or sudden movement of potentially explosive materials in the container.
To prevent structural stress or a collapse of the structure, apply only as much water or foam that is necessary to ensure the containment of the fire. A fire in an industrial dust collector, hopper or bin is not extinguished until the structure is empty.

Pre-set relief valves for explosion venting may be present. Firefighters should stand clear of all openings.

Opening any access points must be done with extreme caution and as remotely as possible using aerial devices and ladders along with:

- pike poles,
- ropes or other equipment

in order to allow access while creating a minimum exposure to the individual undertaking the operation and a maximum distance from the hazard.

Crews should refrain from using any power tools to open access points, hatches or hinge pins as residual sparking and vibration may create an even greater explosive hazard. Opening of lower doors of hoppers should only be done after proper ventilation practices have been completed.

If the dust collector, hopper or bin needs to be unloaded, this operation must be done very slowly and systematically to ensure adequate soaking of any contents and safe removal.

Note: Incidents involving agricultural silos are unique and may require different tactics and approaches from those described in this Guidance Note.

Reference: GN # 6-16 Machinery/Electrical Lockout during Emergency Response
FIRE FIGHTERS GUIDANCE NOTE # 6-28

ISSUE: RESCUE FROM A COLLAPSED TRENCH

Fire departments are being called upon to assist with incidents where one or more persons are trapped in a collapsed trench or excavation.

An “excavation” is defined as the hole that is left in the ground as a result of removing material. A “trench” is defined as an excavation where the excavation depth exceeds the excavation width.

Trench rescue requires highly specialized training, equipment and procedures in order for the rescue to be completed in a safe manner. Any fire department that intends to enter trenches to provide rescue services should ensure that Operational or Technician Level trench rescue training (as appropriate to the level of emergency response determined by the fire department) are provided and that appropriate resources are in place in order to safely perform this work.

Firefighters who have not been trained beyond “Awareness Level” should never enter a collapsed trench.

At a minimum, fire departments should ensure that each firefighter is provided with “Awareness Level” trench rescue training that includes the following:

- Recognizing the need for a trench and excavation rescue;
- Identifying the resources necessary to conduct safe and effective trench and excavation emergency operations;
- Initiating the emergency response system for trenches and excavations;
- Initiating site control and scene management;
- Recognizing general hazards associated with trench and excavation emergency incidents and the procedures necessary to mitigate these hazards within the general rescue area;
- Recognizing typical trench and excavation collapse patterns, the reasons trenches and excavations collapse, and the potential for secondary collapse;
- Recognizing the unique hazards associated with the weight of soil, soil conditions, stability and its associated entrapping characteristics;
- Initiating a rapid, non-entry extrication of non-injured or minimally injured victim(s).

Fire departments that do not provide trench rescue services should have plans in place for the provision of these services in the event that they encounter a collapsed trench where rescue is required.
FIRE FIGHTERS GUIDANCE NOTE # 6-29

ISSUE: PREVENTION OF FALLS FROM FIRE APPARATUS

Falls from fire apparatus can result in firefighters sustaining serious injuries. Fire departments should establish procedures to protect firefighters from the hazard of falls. Employers should conduct a risk assessment of fire apparatus in consultation with the Joint Health and Safety Committee or Health and Safety Representative and develop procedures specific to each fire apparatus to prevent falls from the apparatus while performing the normal job functions.

Fire apparatus should not be used as observation platforms unless specifically designed for that purpose.

The preferred methods of risk elimination include ground level hose loading or other means to prevent the possibility of falls. New fire apparatus may have engineered design features that provide retractable railings or folding hose bed covers that fold to the outside edge to provide a barrier. For existing fire apparatus without such features, the following guidance is offered.

Where work is required to be performed on top of the fire apparatus:

- Minimize the number of personnel required on top of the fire apparatus to accomplish the task assigned;
- Where personnel are working on top of the fire apparatus, a second person should stand at grade level and monitor the personnel working on top;
- All personnel should work from the centre of the fire apparatus facing the outside of the fire apparatus when loading hose, etc.;
- Caution should be exercised where the top of the fire apparatus is slippery (i.e. snow or ice on top) which could result in a loss of footing;
- Personnel should use the three point contact method of mounting/dismounting apparatus.

Note: When in fire stations, reference the requirements of Section 85 of the Regulations for Industrial Establishments where workers are exposed to the hazard of falling more than three metres. In addition, all personnel working on hose beds in the fire station should be made aware of fans, heaters, and other hazards overhead.
FIRE FIGHTERS GUIDANCE NOTE # 6-30

ISSUE:  PESTICIDE STORAGE AND PESTICIDE STORAGE FIRES

MOE Fire Department Notification Requirements

The Ontario Ministry of the Environment (MOE) has amended a regulation made under the Pesticides Act. Section 112 of O. Reg. 63/09 requires that persons who store certain pesticides provide annual notice to the local fire department in the jurisdiction in which the pesticide is stored on an MOE supplied form indicating that pesticides are stored on the site. The form provides the local fire department with information about the identity of the pesticides, where the pesticides are located within the facility, conditions of storage and the identity of the person responsible for the pesticides.

The requirement to provide annual notice to the local fire department applies to the storage of pesticides by manufacturers and formulators of pesticides, MOE licensed vendors who sell pesticides, and MOE licensed operators of a pest control business. Other operations/facilities that store pesticides such as golf courses, farms, municipal works departments and utility operations are not covered by this section of the regulation and are not obligated to annually notify local fire departments.

Pesticide classification is different from standard Dangerous Goods (UN) or Workplace Hazardous Materials Information System (WHMIS) classifications normally referenced by fire departments at dangerous goods incidents. More information on pesticide classification is available from MOE.

It is recommended that when an MOE Fire Department Pesticide Notification Form is received by the local fire department that they coordinate a site inspection to assist these facilities with a fire safety plan. MOE Pesticides Specialists are available to accompany local fire departments on joint inspections of pesticide facilities upon request.

Some pesticide manufacturers and some large vendors already have these fire pre-plans in place based on standards from the "CropLife Canada Manufacturing Code" and the "Agrichemical Warehousing Standards Association (AWSA)". The sites would be classed as manufacturing or farm retailers and agricultural distributors. There are approximately 4 sites in Ontario that follow the CropLife Canada Manufacturing Code and 254 sites in Ontario that comply with the standards of the AWSA. Those sites store inventory in compliance the Ontario Fire Code and National Fire Code according to the hazard of the product. Included in these standards is the requirement for a site to prepare an Emergency Response Plan along with the storage layout and quantities of...
the hazardous and non-hazardous products in the warehouses. A yearly sign off by the local Fire Chief is required for them to meet these industry standards.

Fire departments should also consider inspections of other facilities that may store pesticides such as farms, golf courses, public utilities, etc.

**Fire Department Pre-Plans for Pesticide Storage Fires**

It is recommended that fire departments develop a fire pre-plan for each pesticide storage site and that a “Controlled Burn” strategy be considered by fire departments for fires that have spread into pesticide materials at these locations. This should be discussed with the owner and the insurance company providing coverage for that property.

Retail vendors who are selling ‘domestic’ pesticides will be limited in the type of pesticides available and therefore limited quantities would probably be found as part of a larger home improvement retail business. Due to the limited quantities at these retail locations, there may not be a need for a detailed pre-plan that would apply to the larger manufacturing or warehousing operations.

**LIFE SAFETY CONCERNS**

- Protection of first responders and the public is a major concern with fires involving pesticides.
- The management of airborne contaminants at ground level hinges on the temperature of combustion, and the exit temperature from a structure. Where fires have been allowed to burn at high temperatures, the risk has been lowered significantly.
- First responders at an incident involving pesticides must be protected with self-contained breathing apparatus and standard turn-out gear at a minimum.

**FIRE CONTROL CONSIDERATIONS**

- Where an incident cannot be addressed at the incipient (initial) stage, and where it is possible to ventilate and let burn, this approach should be given serious consideration.
- If a facility is fully involved or free burning, life safety is greatly enhanced by remaining outside the structure upwind of smoke and exhaust gases while the pesticides structure burns itself out.
ENVIRONMENTAL CONCERNS

- Environmental damage, resulting from fires involving pesticides, increases in proportion to the volume of water used in an attempt to control and extinguish the fire.
- The resulting effluent is normally heavily contaminated with toxic compounds and is extremely difficult to contain with diking (other than very heavy clay soils).
- Products of incomplete combustion, due to low temperature burns, tend to be substantially more toxic and less stable than the original compounds.
- Air quality during a pesticide fire, at or near ground level, will deteriorate dramatically as the combustion temperature is reduced. A combustion temperature of 982° Celsius, for example, provides complete thermal decomposition of pesticides with resulting emissions of primarily carbon and water. At this temperature, all contaminants are carried high into the atmosphere where dispersion ensures that toxic levels at or near ground level does not occur.

Please find attached an example of the MOE Form “Fire Department Pesticide Storage Notification” on the following pages. A functional copy of this form is available through the MOE’s Environmental Assessment and Approvals Branch (Toll Free: 1-800-461-6290 or 416-314-8001).

Additional information is available from the following websites:

http://www.ene.gov.on.ca/en/contact/regionalmap.php  A contact list for MOE Regional and District Offices. Ask to be directed to the Pesticide Specialists.

http://www.croplife.ca

http://www.awsacanada.com
Fire Department Pesticide Storage Notification

Ontario Regulation 63/09 under the Pesticides Act requires that:

- Any person who stores a Class 1 pesticide MUST give a written notice annually to the fire department responsible for the area in which the pesticide is stored.
- Every manufacturer, licensed operator, or licensed vendor who stores a Class 2, 3, 4, 5, 6, 7, or 8 pesticide MUST give a written notice annually to the fire department responsible for the area in which the pesticide is stored.

This form, when completed and forwarded to the local fire department, serves as the notification required under Section 112 of O. Reg. 63/09 under the Pesticides Act. Retain a copy for your records. Please notify the fire department if any of the information below changes.

Part A

<table>
<thead>
<tr>
<th>Name of Fire Department (to which notification is being made)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of Fire Department</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td></td>
</tr>
<tr>
<td>Postal Code</td>
<td></td>
</tr>
<tr>
<td>Licence No.</td>
<td></td>
</tr>
<tr>
<td>Business Name</td>
<td></td>
</tr>
<tr>
<td>(Indoors or Licence Number (if applicable))</td>
<td></td>
</tr>
<tr>
<td>Address (street, street name or number and city)</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td></td>
</tr>
<tr>
<td>Postal Code</td>
<td></td>
</tr>
<tr>
<td>Business Tel. No.</td>
<td></td>
</tr>
<tr>
<td>Business Fax. No.</td>
<td></td>
</tr>
<tr>
<td>Name of Person Responsible for the Storage of Pesticides (please print)</td>
<td></td>
</tr>
<tr>
<td>After Hours Contact Telephone No.</td>
<td></td>
</tr>
<tr>
<td>Name of Alternate Contact (please print)</td>
<td></td>
</tr>
<tr>
<td>After Hours Contact Telephone No.</td>
<td></td>
</tr>
</tbody>
</table>

This business has a fire pre-plan file with the local fire department under the CropLife Canada Certified Manufacturing Code or Agricultural Warehousing Standards Association audit program. Yes/No - if yes, continue to Part B only.

If No., please describe the specific location of pesticide storage and conditions of storage (e.g., separate or attached facility, temporary or permanent structure, access to facility, location of nearby buildings and water sources, etc.) on the diagram of the storage area(s) in the section on the reverse side of this form. Continue to Part B and C.

Part B

Pursuant to Section 112 of O. Reg. 63/09 under the Pesticides Act, I am providing annual notification to the local fire department that the following pesticides are stored at the address indicated on this form.

<table>
<thead>
<tr>
<th>In storage (check all that apply)</th>
<th>Pesticide Federal Class</th>
<th>Federal Description</th>
<th>Ontario Classification under O. Reg. 63/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td></td>
<td>For use in the manufacture of a pesticide product or a product regulated under the Fertilizers Act</td>
<td>(Class 1)</td>
</tr>
<tr>
<td>Commercial or Restricted</td>
<td></td>
<td>For use in commercial activities that are specified on the label or the restricted class when the label specifies essential conditions respecting the display, distribution or limitations on the use of, or qualifications of persons who may use the product.</td>
<td>(Class 2, 3 or 4)</td>
</tr>
<tr>
<td>Domestic</td>
<td></td>
<td>To be distributed primarily to the general public for personal use in or around their homes</td>
<td>(Class 4, 5, 6, 7 or 8)</td>
</tr>
</tbody>
</table>

1. A manufacturer means a person who carries on business respecting the
   i. Formulation of a Class 1 pesticide into another pesticide,
   ii. Manufacturing of a pesticide into a product,
   iii. Incorporation of a pesticide into a product,
   iv. Packaging or distribution of a pesticide or product containing a pesticide.

2. Operator means the person(s) who has the control and management of an extermination business.

3. Vendor means a person that is the holder of a General vendor licence allowing for the sale of any pesticide to an authorized person or the holder of a Limited vendor licence allowing for the sale of domestic pesticides to an authorized person.

4. Person responsible means: a certified outlet representative of a General vendor licence holder; or a person who is the owner or person having the charge, management or control of storage of a pesticide at a manufacturing or formulation plant; or a person having the charge, management or control of storage or display of a pesticide as a holder of a Limited vendor licence.
Part C
Pesticide Storage Location(s)
Please provide a diagram indicating the location(s) of pesticide storage within the facility, access points, and location of nearby buildings and water sources.

Example
FIREFIGHTERS GUIDANCE NOTE # 6-31

ISSUE: AGRICULTURAL SILOS

Fire departments should identify the locations and types of agricultural silos in their response area in order to adequately pre-plan for emergency situations.

Firefighters may respond to locations in which there are fires in or around agricultural silos. Rescue situations may also cause safety issues (e.g. confined spaces) for responders.

There are three types of vertical silos used in agricultural areas in Ontario. Each can pose safety concerns to the firefighters in a fire or rescue situation.

Conventional Silo
These silos can be made of banded concrete slabs, poured concrete or steel plates. These silos unload from the top. Silo fires can result from malfunctioning unloader equipment, spontaneous combustion, crops put in too dry, or barn fires in close proximity. Rescues may be required for farm personnel who are required to enter silos to service un-loader equipment.

Oxygen-Limiting Silos
These silos are made of poured concrete or steel plates. Silos are unloaded from the bottom and fires usually are due to oxygen getting into the silo from leaking seams, un-loader areas, crops put in too dry, or barn fires in close proximity. Farm personnel do not need to enter the silo during unloading or when crops are in the silo as there is not enough oxygen to support life, but there have been cases where people have entered and have collapsed due to low oxygen or the gases produced by the crop preservation process.

Converted Oxygen-Limiting Silos
These silos are oxygen-limiting silos that have been converted to a conventional silo. Silos are unloaded from the top and may still make use of bottom unloaders. These may contain similar hazards to both Oxygen-Limiting and Conventional Silos.

Nitrogenous products in preserved crops give off toxic gases when burning. During an emergency, there is a potential exposure to toxic silo gases and a deficient oxygen atmosphere. Disturbance of grain dust (causing it to become airborne) and the potential presence of methane (microbial decomposition of organic products) can also be sources of fuel for an explosion. Firefighters should exercise extreme caution when responding to these incidents and should not enter into the structure to extinguish fires or conduct a rescue unless the identified hazards and associated risks are mitigated or removed.
Incident Command should identify the silo type, product, hazards and the extent and degree to which fire and heat are transferred within the silo and the surrounding feed rooms or buildings. If available, thermal imaging cameras should be used for this purpose.

An adequate water supply is to be established before commencing any suppression operations and, depending on products involved, firefighting foam may be a consideration. Explosions of both Conventional and Oxygen-Limiting silos during fires are possible.

In a Conventional Silo, apply only as much water or foam as necessary to ensure the containment of the fire. Large amounts of water in the structure may cause a collapse. Do not climb the chute or outside ladder as the system may fail due to heat damage. Until the structure is empty, a fire in a silo should not be considered to be extinguished.

In an Oxygen-Limiting or a Converted Oxygen-Limiting Silo, do not open any hatches, doors or spray water into structure. By introducing water and oxygen, an explosion may result. The silo manufacturer should be consulted for advice on proper procedures to extinguish these fires.

**Rescues**

Rescues from agricultural silos may require Technician Level rope rescue techniques as there are limited anchor points on these structures. Where the situation may involve confined spaces, refer to GN #6-5 Confined Space Rescue.

Note: Incidents involving industrial dust collectors, hoppers and bins may require different tactics and approaches from those described in this Guidance Note.

**Reference:**

GN # 6-4 Rope Rescue  
GN # 6-5 Confined Space Rescue  
GN # 6-16 Machinery/Electrical Lockout during Emergency Response  
GN # 6-27 Fires in Industrial Dust Collectors, Hoppers and Bins

The Ministry of Agriculture, Food and Rural Affairs Fact Sheet: “Silo and Hay Mow Fires on Your Farm”

FIREFIGHTERS GUIDANCE NOTE # 6-32

ISSUE: ELEVATOR RESCUE

For the purposes of this Guidance Note, Elevator Rescue is considered to be the removal of occupants from inside a disabled or stalled elevator car through the elevator doors and does not include rescues from elevator shafts, hoist ways or through the top of the elevator car.

Where fire departments determine that there is a need to engage in elevator rescue, SOPs/OGs should be developed to cover these types of rescues and fire departments should ensure that personnel who respond to such emergencies are trained appropriately to perform this task.

Personnel assigned to elevator rescue should:
- Be trained to determine when an extraction from a stalled elevator is necessary.
- Be made aware of the hazards associated with elevator systems during a rescue, including those related to firefighter safety as well as public safety.
- Be informed regarding how to perform a mainline disconnect with lock-out and tag-out procedures. Firefighters also need to be informed that a rescue attempt should be aborted if upon checking for mainline disconnect confirmation it is found that one or more power phases (legs) are not disconnected.
- Be trained to safely open doors into stalled elevators using tools provided by fire departments.
- Be trained to safely immobilize different types of elevators to prevent unexpected movement during extrication.

At no time should firefighters enter the elevator shaft or hoist way during an elevator rescue. These operations, as well as the removal of occupants through the top of the elevator car, require specialized knowledge and Technician Level training in various technical rescue disciplines including, but not limited to, confined space rescue and rope rescue.

Note: The Elevating Devices Safety Program of the Technical Standards & Safety Authority (TSSA) offers a two day training program, Elevator Emergency Response Training for Firefighters (www.tssa.org). This course prepares firefighters to safely respond to emergency situations involving elevators, including evacuation. Nothing restricts personnel that have taken the course from imparting their knowledge to others within the fire service. However, such training requires practical exercise, in accordance with the skills and safety principles as taught by the TSSA and should be relayed with this caveat.

Reference:
GN # 6-4 Rope Rescue
GN # 6-5 Confined Space Rescue
GN # 6-16 Machinery/Electrical Lockout during Emergency Response

(Note: Consulting the manual by itself is not considered to be training.)
FIRE FIGHTERS GUIDANCE NOTE # 6-33

ISSUE: HAZARDS CREATED BY ABANDONED BUILDINGS

There is a significant risk of injury to firefighters while operating at fires involving abandoned buildings. For the purposes of this Guidance Note, an abandoned building is considered to be one that is in a state of disrepair to the point where it can pose a health and safety hazard for firefighters.

Fire departments should consider the following and develop SOPs/OGs with respect to abandoned buildings:

- Identify and document the location of known abandoned buildings in their response area and make the information available to fire crews;

- Abandoned buildings may be deteriorated and structurally unsound. Firefighting in close proximity to, on, or in such structures may pose significant risks;

- In fires involving buildings that are known or reasonably believed by the fire department to be abandoned, Incident Commanders should exercise extreme caution and give due regard to fire conditions and all relevant fireground factors prior to committing firefighters to interior firefighting positions (Note: firefighters should not be committed to interior operations in well advanced fires in structures that are known to be abandoned);

- If interior firefighting operations are undertaken, a charged hose line should be deployed for each crew. Where thermal imaging cameras are available, and firefighters have been trained on their use and limitations, they can be used to determine the potential of trapped occupants, location of the fire, and other hazards that are listed below.

The following conditions could exist in abandoned buildings and may create hazardous situations:

- Open shafts
- Pits and holes
- Maze like configurations
- Limited/obstructed entry and egress
- Blocked or damaged stairs
- Structural degradation
- Combustible contents: fire load
- Delay in discovery of fire
- Multiple fire locations
- Biological hazards
- Hazardous chemicals
Reference:
GN # 6-11 Rapid Intervention Teams (Rescue)
GN # 6-18 Unprotected Lightweight Building Construction
GN # 6-24 Building Collapse During Fire Situations
ISSUE:  SOLAR PHOTOVOLTAIC (PV) SYSTEMS

Fire Departments should develop SOPs/OGs on fighting fires involving solar photovoltaic (PV) systems (also known as solar panel systems).

A PV installation typically includes:
- Array(s) of solar panels, because a single PV panel can only produce a limited amount of power, a typical PV system installation contains several panels connected together to form an array;
- Inverter(s), which is a power conversion unit that converts direct current (DC) generated by the array to alternating current (AC); and
- Interconnecting wiring.

PV systems are used for either on or off grid applications.

In the event of a fire, shutting down the electricity in a building with a PV system is more complicated than in a building without one because the system is energized from two sources (utility and PV system).

The PV system can be isolated from the rest of the building’s wiring system by shutting down the “Utility Disconnect” of the PV system in addition to the main electrical switch. These system disconnects are usually located near the meter, main electrical panel, PV system inverter and/or on the rooftop.

The Ontario Electrical Safety Code requires clear marking and labelling of the electrical system equipment indicating the system is fed from more than one source.
EXAMPLE PICTURES PROVIDED BY THE ELECTRICAL SAFETY AUTHORITY

SAFETY CONCERNS:

- The primary hazard for firefighters dealing with PV installations is electric shock. An array of multiple panels can produce DC current and voltages above 600 volts. This represents a hazard for firefighters if they come in contact with damaged panels or energized exposed wiring during firefighting or ventilation operations.
- The unique characteristics of the DC current generated by a PV system mean that an arcing fault is more intense and sustained than that from AC. In addition, the value of arcing fault current may be too low for the required circuit protective devices to operate. This creates additional fire hazards unique to these systems.
- The solar PV system cannot simply be "switched off". Shutting down the PV’s “Utility Disconnect” switch, inverter and the main electrical switch will disconnect the array from the building and/or the grid. However, the PV panels and other apparatus connected from the solar panels to the inverter will always remain energized as long as they are exposed to a source of light. They should be treated as live electrical equipment.
- Solar PV systems add additional weight to the roof of a building, which may pose a structural concern. This may require alternative ventilation tactics, particularly where roof joists have been compromised by fire.
- Power cables and PV panels pose trip and slip hazards for roof operations.
- PV panels exposed to fire can produce toxic and carcinogenic combustion products.
- Battery storage areas can generate corrosive/explosive gases when exposed to fire and are another potential source of electric shock.

FIREFIGHTING SAFETY PRECAUTIONS:

When dealing with fires in buildings with solar PV systems, the following should be considered:

- Assume the solar PV array is energized at all times.
- Inform the Incident Commander immediately upon identifying the presence of a solar PV system.
- Remember that securing the main electrical panel, inverter and PV’s “Utility Disconnect” switch will not shut down the solar PV system. In the daytime, electricity will continue to be generated by the PV system.
- Stay away from the panels and conduit. Do not cut into, remove, or walk on the solar PV system.
- Wear proper PPE including SCBA.
- Contact the local utility provider.

Note: At night, moonlight or apparatus-mounted scene lighting may still produce enough light to generate electricity from the arrays. Lightning strikes can also be bright enough to create an electrical surge in the system.
Reference:

GN # 6-20 Electrical Hazards in Rescue and Fire Situations

This Guidance Note was developed in consultation with the Office of the Fire Marshal and the Electrical Safety Authority.
FIRE FIGHTERS GUIDANCE NOTE # 6-35

ISSUE: WIND TURBINES

Fire Departments should develop SOPs/OGs on emergency incidents involving wind turbines.

Fires involving wind turbines may present a health and safety hazard to firefighters due to the electronics, flammable oils and hydraulic fluids that exist in the turbines. For example, up to 750 litres of hydraulic oil can be found in the nacelle. Electrical fires can also result from both shorts in equipment and surges that may result from lightning strikes. Additionally, secondary wind driven brush fires originating from wind turbine fires can also result in significant damage. Due to the height of wind turbines, firefighter health and safety may be endangered during a rescue from these turbines.

Fire Departments should contact the owner of the wind turbine(s) in their response area and establish the level of assistance that the fire department is able to provide. There may be opportunities for training and/or equipment to be provided to the local fire department from the wind turbine owner.

In cooperation with the wind turbine owner, fire departments should develop response safety plans that address issues such as:

- Access to sites and contact numbers (24/7) for site supervisory staff
- Safe collapse zones
- Rescue options for workers trapped in the nacelle in non-fire situations
- High-voltage components and combustible materials within the wind turbine.

SAFETY CONCERNS AND FIREFIGHTING SAFETY PRECAUTIONS:

Although it is rare, there is a potential for wind turbines to catch fire. While some wind turbines may be equipped with suppression systems, others may not. Most fires in wind turbines will be caused by mechanical failure of the equipment within the nacelle or electrical issues and are fuelled by up to 750 litres of hydraulic oil in the nacelle as noted above.

Typically, a turbine fire does not last long enough to warrant aerial attempts to extinguish the fire. As such, it should be allowed to burn itself out while staff and fire personnel maintain a safe area around the turbine and protect against the potential for spot ground fires that might start due to sparks or falling material. Power to the affected turbine should be disconnected by qualified personnel.

Although turbine tower collapses are rare, there is a potential of tower collapse due to various circumstances. The reasons for collapses vary depending on conditions and tower type, but have included blade strikes, rotor over-speed, cyclonic winds, and poor or improper
maintenance (torque bolts). The majority of the major components (rotor, tower, and nacelle) have fallen within 500 metres from the base. The fire department should establish a safe work perimeter around the base of the wind turbine when there is a risk of public exposure to this hazard.

Reference:

GN # 6-20 Electrical Hazards in Rescue and Fire Situations
SECTION SEVEN

Training

Health and Safety During Practical Training Sessions ........................................ 7-1
Training Requirements....................................................................................... 7-2
Documentation of Training Plus Daily Training Report.................................. 7-3
Firefighter Survival and Self Rescue Training................................................. 7-4
Live Fire Training Considerations for Acquired Structures............................ 7-5
FIRE FIGHTERS GUIDANCE NOTE # 7-1

ISSUE: HEALTH AND SAFETY DURING PRACTICAL TRAINING SESSIONS

Good training is a key factor in preventing firefighter injuries. Unfortunately, injuries and fatalities can result from practical training sessions. Injuries can also occur when firefighters practice techniques without adequate supervision and safety precautions.

The purpose of this guidance note is to stress the need for additional safeguards during practical training sessions (i.e. fireground evolutions) where firefighters are at risk of being injured. It is not the intent of this guidance note to include classroom only training as a practical training session.

To prevent injuries during practical training sessions the following precautions should be followed:

- Select external agencies based on their experience, qualifications and references
- Increase margins of safety based on the assumption that things will go wrong during practical training sessions
- Assign a supervisor with the authority to stop the training if they believe unnecessary risks are being taken
- Ensure that there is a plan for every practical training session carried out internally or by external agencies (Note: too many injuries have occurred as a result of unplanned or poorly planned practical training sessions)
- The fire chief or designate should review the training plan to ensure that it allows for the graduated acquisition and testing of skills and to identify potential hazards (Note: don't be afraid to question the instructor to determine if he or she has a thorough understanding of the risks and protective measures)
- The fire chief or designate should ensure that the teaching agency is aware of the department's or corporation's health and safety policy
• The fire chief or designate should ensure that an approved Training Safety Plan is incorporated into or attached to the training plan for each practical training session. Where the same practical training session will be delivered across the department or on multiple occasions, the review and approval could be given annually and prior to the first delivery of the practical training session. (A Sample Training Safety Plan provided by the Ontario Fire College is attached.)
Sample
Training Safety Plan for (name of practical training sessions)

Training Location: ________________ Date: ________________

Training Officer / Lead Instructor:

Responsibilities:
The Training Officer / Lead Instructor shall be responsible for the safety and welfare of all students and instructors. The Training Officer / Lead Instructor will assign all instructor tasks and ensure that the approved curriculum is followed. The Training Officer / Lead Instructor will report any incident / accident or injury to the Fire Chief or his designate at the earliest opportunity by the quickest means available.

I acknowledge and accept the responsibilities of Training Officer / Lead Instructor.

Signed: ________________ Date: ________________

Safety Officer

Responsibilities:
The safety officer shall be responsible for the prevention and elimination of unsafe acts and conditions. The safety officer shall not take on any other tasks, instructional or other, while practical operations are ongoing. The safety officer must communicate with the Training Officer / Lead Instructor and identify and immediately terminate operations if he/she feels that an unsafe action or condition exists or is going to exist.

I acknowledge and accept the responsibilities for safety officer.

Signed: ________________ Date: ________________

(Safety Officer signs at time of course delivery)

Fire Chief or Designate

This plan is approved for use on all (name of practical training sessions) following the approved curriculum offered at the (name of fire department) in (year). Any variations from this plan due to changes in environment, equipment or circumstances, will be noted and initialed by both the Training Officer / Lead Instructor and the Safety Officer, prior to training, failure which this plan is not deemed to be approved for use.

Signed: ________________ Date: ________________

Fire Chief

Approved (date)

Next Review for Approval (date)
Sample
Training Safety Plan for (name of practical training sessions)

{Name of Fire Department}

Pre Burn Check List

<table>
<thead>
<tr>
<th>COMPLETED</th>
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<tbody>
<tr>
<td>Planning</td>
</tr>
<tr>
<td>Hazard / Pre-burn Form Complete</td>
</tr>
<tr>
<td>Instructor Tasks Assigned</td>
</tr>
<tr>
<td>Equipment Inspected</td>
</tr>
<tr>
<td>Water Supply</td>
</tr>
<tr>
<td>Evacuation Route for EMS/Staging</td>
</tr>
<tr>
<td>Safety</td>
</tr>
<tr>
<td>Safety Officer Assigned</td>
</tr>
<tr>
<td>Safety Office shall inspect all student and instructor PPE</td>
</tr>
<tr>
<td>Safety Officer shall designate a first aid location</td>
</tr>
<tr>
<td>Student Site Tour</td>
</tr>
<tr>
<td>Personal Accountability System in Place</td>
</tr>
</tbody>
</table>

Unusual Conditions/Concerns:

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LEAD INSTRUCTOR SIGNATURE

DATE

SAFETY OFFICER SIGNATURE

DATE

Approved [date]

Next Review for Approval [date]
FIRE FIGHTERS GUIDANCE NOTE # 7-2

ISSUE: TRAINING REQUIREMENTS

Under the requirements of Section 25(2)(h) of the Occupational Health and Safety Act and more specifically, under Section 25(2)(a) the employer is responsible to:

- Provide information, instruction and supervision to a worker to protect the health or safety of the worker.

In order to meet the requirements of this section, it is incumbent upon employers to ensure that firefighters are trained to safely perform to a defined level of response as determined by the employer. Safety proficiency is a function of training, experience, internal review of performance and ongoing training based on deficiencies identified by internal review.

Operational Procedures/Notices should address the following key points:

- The employer shall provide training and instruction for all fire department members commensurate with the duties and functions that they are expected to perform. For example, if the employer decides that the Fire Department will only make shore based water rescues, then Departmental Operational Procedures should advise the fire service who to call if a water entry rescue is required.
- The employer shall provide training and instruction regarding the safe operation of equipment and apparatus that fire fighters may be required to operate in the course of their duties.
- Before a new piece of equipment is put into service, all personnel that would normally use the new equipment shall be trained in its use, safety precautions to be taken and general maintenance required.

Fire Departments should develop a system that improves safety by encouraging an open internal review of performance objectives aimed at improving skills.

Note: For health and safety during training exercises, please refer to Guidance Note #7-1 Health and Safety during Training Exercises
FIRE FIGHTERS GUIDANCE NOTE # 7-3

ISSUE: DOCUMENTATION OF TRAINING PLUS DAILY TRAINING REPORT

Rationale for Keeping Training Records:

Under Section 54(1)(p) of the Occupational Health and Safety Act, an MOL inspector may require an employer to produce documentation that training has been provided to workers. There is no standard format for this record keeping. However, if an employer met the criteria for keeping training records identified in this Guidance Note, the employer would meet the intent of Section 54(1)(p).

Criteria:

- All documentation needs to be complete and accurate.
- Training records need to be promptly completed after training is conducted.
- The objectives of the training program in relation to the level of service provided, need to be documented.
- Documentation should indicate that individuals have met the required objectives by having a competent supervisor complete the form. The documentation should record the date(s) training was received and the date it was completed. Documentation of completed objectives may be signed off by the student, as a deterrent to falsification of training records. Normally having a competent person record that training has been completed is sufficient.
- Forms may be of any design incorporating the information outlined in this Guidance Note (sample attached).
- Where computerization is used, back up copies of data should be stored in a separate location.
- The length of time that training records are kept should be in accordance with municipal policy and the requirements of law.
- Training reports should be stored so that a periodic review is possible for the purposes of improving the training program and to allow tracking of personnel status in regards to training completion.
<table>
<thead>
<tr>
<th>Date</th>
<th>Shift</th>
<th>Topic</th>
</tr>
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<table>
<thead>
<tr>
<th>Facilitator:</th>
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<th>Training Duration:</th>
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</table>

<table>
<thead>
<tr>
<th>Performance Objectives (what was done)</th>
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<table>
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<th>Training Resources/References:</th>
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</table>

<table>
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<th>Training Methods: (check appropriate Item)</th>
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</table>

- Assigned Reading
- Discussion
- Lecture
- Video
- Modified Lecture
- Case Study
- Practical
- Demo
- Other (describe)

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<th>Met Objective</th>
<th>More Training</th>
<th>Participant Signature</th>
</tr>
</thead>
</table>

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**Ontario Fire Service**

**Section 21 Advisory Committee**

**Ministry of Labour**

**Ministère du Travail**

Documentation on Training Plus Daily Training Report

Effective: January 2003

Revised: January 2007

Page 2 of 2
FIRE FIGHTERS GUIDANCE NOTE # 7-4

ISSUE: FIREFIGHTER SURVIVAL AND SELF RESCUE TRAINING

The key to surviving a fire ground emergency are prevention and training. Self rescue and firefighter rescue are low frequency, high risk events that require practice and training. Employers should provide their personnel with training programs that introduce firefighters to various self-rescue techniques on the fire ground. Fire departments should, in consultation with their Joint Health and Safety Committee or Health and Safety Representative, incorporate into their SOPs/OGs the principles set out in this guidance note.

The following basic elements are recommended in a program:

- History of the cause of firefighter injury/fatalities in structural firefighting
- Mayday recognition and response
- SCBA familiarization, emergency procedures and air management
- Review of building construction features which can cause firefighter entrapment.

The following additional elements need to be considered by the Fire Department when developing a practical program:

- Rescue and escape procedures (i.e. hose line/rope escape or other techniques)
- Wall breach
- Low/reduced profile emergency exit procedures using full PPE and SCBA
- Entanglement prevention and emergency disentanglement procedures
- Emergency exit procedures

Training on the above subjects should include practical evolutions combined with any classroom theory provided and instructors should have completed practical training before being allowed to train others.
FIRE FIGHTERS GUIDANCE NOTE # 7-5

ISSUE: LIVE FIRE TRAINING CONSIDERATIONS FOR ACQUIRED STRUCTURES

Live fire training provides an important tool to the fire service. However, if pre-planning and safe operations are not followed this type of training has great potential for catastrophic failure with possible injuries or deaths of firefighters. Fire departments should, in consultation with their Joint Health and Safety Committee or Health and Safety Representative, incorporate into their SOPs/OGs the principles set out in this guidance note.

An acquired structure is considered to be a building or structure acquired for use by the fire department from a property owner for the purpose of conducting live fire training evolutions. A live fire training evolution should be treated from a safety perspective in the same manner as if it was a real fire emergency.

Live fire is defined as any unconfined open flame or device that can propagate fire to the building or other combustible materials.

Prior to commencement of the training evolution, the following should be considered:

- Where a firefighter will be working in or on the building, ensure that the building is structurally sound for the purpose of live fire training (i.e. confirmed by a building inspector or engineer).
- Remove or repair all hazardous conditions. These conditions could include the presence of asbestos or other designated substances, heavy objects on upper floors or roofs/chimneys, holes in floors covered and stairs made safe. Disconnect utilities as they pose a life safety risk.
- Conduct a pre-burn briefing including a building walk through with specific assignments given to all participants and instructors outlining the training exercise expectations.
- Establish an Incident Command System.
- Ensure that competent Instructor(s), and a designated Incident Safety Officer are present during the evolution. The Incident Safety Officer is to continually monitor the safety conditions and has the authority to stop the exercise at any time.
- Have on site the minimum number of participants and instructors to meet all tasks at hand including Rapid Intervention Teams (RIT).
• Ensure that participants have the appropriate knowledge and practical training prior to participating in the evolution (e.g. safety, fire behaviour, portable extinguishers, PPE, ladders, fire hose, appliances and streams, overhaul, water supply, ventilation and forcible entry).

• Put into place a universal warning that safety is compromised and the evacuation of all personnel is required (e.g. 3 blasts of an air horn).

• Appropriate personal protective equipment (PPE) including PASS (to be activated at all times) is to be worn during the training evolution.

• Remove unnecessary combustibles.

• Use fuels that have known burning characteristics (e.g. wood and paper). Use the amounts necessary to create the desired fire size only. (Flammable and Combustible liquids, furnishings with foam padding, or foam insulation create dangerous amounts of heat and smoke and should not be used.)

• Never allow participants to act as “victims” for search and rescue. Use only rescue mannequins or figures which are not to be dressed in bunker gear.

• Identify access and egress points (that are free of debris and obstructions) to all participants.

• Ensure that a sufficient water supply is on site. A minimum of 50% more than calculated should be available to handle exposure protection or unforeseen situations. Hose line sizes, types of nozzles, and fire streams that are to be utilized will all impact on water requirements.

• Utilize separate apparatus to supply attack lines and backup lines to ensure reliability of the water supply.

• Consider the following during the planning process: the fire spread, duration of burn, and void spaces. These can lead to premature weakening of the structure and can cut off exit routes.

Note: For additional information regarding the conducting of live fire training evolutions, NFPA 1403 and/or the Simulation Guide published by the Office of the Fire Marshal can be consulted by fire departments.

Reference:
- GN # 2-1 Incident Command
- GN # 2-4 Incident Safety Officer
- GN # 5-1 Firefighter Accountability and Entry Control
- GN # 6-11 Rapid Intervention Teams (Rescue)
- GN # 6-26 Structural Firefighting - Fire Streams and Ventilation
- GN # 7-1 Health and Safety During Training Exercises
Reference:  
GN # 7-2  Training Requirements
GN # 7-3  Documentation of Training Plus Daily Training Report
GN # 7-4 Firefighter Survival and Self Rescue Training
APPENDIX A

A HEALTH AND SAFETY POLICY

INTRODUCTION:

Clause 25(2)(j) of the Occupational Health and Safety Act requires the employer to “prepare and review at least annually a written occupational health and safety policy and develop and maintain a program to implement that policy”. Clause 25(2)(k) also requires that the employer “post at a conspicuous location in the work place a copy of the occupational health and safety policy”.

A sample Policy for the fire service follows:

POLICY

Application:

This Policy of the Corporation of ___________________________ applies to the ___________________________ Fire Department.

Objective:

It is the Policy of ___________________ and the _________________________ Fire Department to conduct all operations in a safe and healthy manner in order to prevent injury or illness to workers.

The elimination of hazards to personnel and property shall be the prime consideration when planning any work activity.

All practical steps shall be taken to ensure that the work environment and work procedures comply with Federal and Provincial Legislation, City Regulations, and Township or Regional Regulations, pertaining to the health and safety of the employee.
Principles:

Every employee has the right to work in a healthy and safe environment.

Employees are encouraged to be actively involved in maintaining a healthy and safe environment.

Cooperation between the employer and the union is desirable in developing and maintaining healthy and safe workplaces.

The prevention of accidents, injury and occupational illness should be an integral part of every job activity.

An internal responsibility system recognizing the roles of every workplace participant - from employee to supervisor to employer and owner – is the key to an effective health and safety program.'

Mandatory requirements:

This policy must be posted in all fire halls.

Reasonable provision for the prevention of accidents, and the promotion of safety and health of all employees, must be made in compliance with the Occupational Health and Safety Act, and other relevant legislation that set out minimum requirements for ensuring workers' health and safety. The need to supplement these minimum requirements, in light of specific workplace situations, must be determined.

Occupational health and safety programs specific to a fire department's operational needs must be developed, applied, and communicated to all employees,

Managers, supervisors, and employees must receive information and training on safe work practices and their duties and responsibilities under applicable legislation.
Responsibilities of Municipal and other Elected Officials:

Under Section 32 of the Occupational Health and Safety Act "Every director and every officer of a corporation shall take all reasonable care to ensure that the corporation complies with:

a) this Act and the regulations;
b) orders and requirements of Inspectors and Directors; and

In keeping with the above, the Corporation of _________________ undertakes to carry out the following:

- To provide as safe and healthy a working environment as can reasonably be expected, given the nature of fire fighting and the resources and technology available.

- To establish an effective internal responsibility system, whereby everyone clearly understands their responsibilities regarding the occupational health and safety of workers.

- To provide ongoing training to heighten employee awareness of known safety hazards and maintain job skills and knowledge.

- To develop and maintain open communication between all levels in the Fire Department to encourage employee participation in the Fire Department's Safety Program.

- To involve all employees in safety through an effective Joint Health and Safety Committee accessible to all department members.

- To periodically review the Fire Department’s health and safety policy, program and Standard Operating Procedures to maintain safety performance.

- To ensure compliance with applicable Federal, Provincial and Municipal safety legislation.
Responsibilities of Firefighters, Administration, Mechanical and Communication Personnel:

Employees are responsible for maintaining a reasonable working knowledge of the requirements of the Occupational Health and Safety Act. They are also responsible for maintaining a reasonable working knowledge of health and safety hazards in the workplace and preventive measures to be taken for their own protection.

Workers must:

- Comply with all procedures and requirements of the Occupational Health and Safety Act, Highway Traffic Act and other applicable safety legislation.

- Report any hazardous conditions which you can not immediately correct to your immediate supervisor, and failing a satisfactory resolve in your opinion, to a member of the Joint Health and Safety Committee.

- Promptly report all accidents or injuries (no matter how minor they may first appear) to your supervisor.

- Not work or operate any equipment that may endanger the safety of yourself or others.

- Not engage in pranks or feats of strength that may endanger yourself or others.

- Wear and care for protective clothing provided by the Fire Department as instructed.

Note: All outside contractors will be required to comply with Provincial, Federal and ________________ Safety regulations when working on City property.
Responsibilities of Fire Department Officers:

Fire Department Officers are responsible for implementing the Occupational Health and Safety Program in the work areas under their supervision.

Their own safety attitudes and actions are important to setting the safe climate of the organization and their job performance will be measured against their efforts in achieving the Fire Department’s safety goals.

All safety complaints/recommendations must be processed in keeping with department policy without undo delay.

Fire department officers must:

- Ensure Provincial, Federal and Municipal legislation is implemented and complied with in their areas of responsibility.

- Ensure the Department’s safety policy and program are posted in a conspicuous place in their work areas and obtain and post new copies of the policy and program as required.

- Document and investigate all reported accidents and take appropriate corrective action within their authority to prevent a recurrence.

- Ensure all employees under their supervision receive adequate training in health and safety legislation, safe work policies, operational guidelines and proper use of vehicles and equipment.

- Inspect their workplaces to correct safety hazards within their authority and to make other hazards that they cannot correct known to the appropriate level of management above them.
Responsibilities of Fire Chief:

Fire Chiefs are responsible for administration, direction and implementation of safety policies to ensure a safe working environment. Their direct involvement and commitment to safety will determine health and safety success or failure.

Fire Chiefs and/or his/her designate must:

- Ensure the safety standards and procedures are developed, maintained, followed and kept up to date.

- Ensure the Fire Department complies with Provincial, Federal; and Municipal safety legislation.

- Consult with all levels of the organization to ensure the safety program is effective and make changes as required.

- Make the Joint Health and Safety Committee aware of safety reports, audits, and hazards that he may be aware of, to fulfil the obligations of the internal responsibility system.

- Review training reports to ensure training is meeting the needs of the safety program.

- Determine health and safety goals of the Department and report yearly results to the City Manager.

Signed: ____________________________________________

Corporation CEO
APPENDIX B

STRUCTURE AND FUNCTION OF

JOINT HEALTH AND SAFETY COMMITTEES

AS AGREED BETWEEN

EMPLOYER

- AND -

NAME AND ADDRESS
OF WORKER
ORGANIZATION

Note: This document has been provided by THE OCCUPATIONAL HEALTH AND SAFETY ADVISORY SERVICE as an INITIAL DRAFT document to assist workplace parties in developing effective, functioning Joint Health and Safety Committees.
PREAMBLE

1. The Occupational Health and Safety Act requires the establishment of Joint Health and Safety Committees where twenty or more workers are regularly employed at a workplace and to hold Joint Committee meetings on a regular basis.

2. It is our firm belief that through joint education programs, joint investigations of problems, and joint resolution of those problems, the workplace will be made safe and healthy for all employees.

3. The parties acknowledge that the proper functioning of the Joint Health and Safety Committee can only be carried out where the representatives of the employer and of the workers are committed to these responsibilities. To effect this, the undersigned undertake to make decisions that will be carried out by their respective organizations.

4. The parties hereto adopt these guidelines in good faith and agree to promote and assist the Joint Health and Safety Committee whenever and wherever possible.

FOR THE EMPLOYER

___________________________
TITLE

FOR THE WORKERS

___________________________
SENIOR WORKER

___________________________
REPRESENTATIVE
STRUCTURE OF COMMITTEE

1.1. The Joint Health and Safety Committee (referred to hereafter as "the Joint Committee"), shall consist of _____ members; _____ members selected by the employer and _____ members selected by _____________________. Alternates may be allowed, however, they shall only be used in emergency conditions and with the approval of the co-chairpersons. Each party will supply a listing of alternates.

1.2. The Joint Committee shall meet on a regularly established schedule as follows:

________________________________

(Changes will be approved by the co-chairpersons.)

1.3. There shall be two co-chairpersons, one (1) from the employer, and one (1) from the workers; appointed for a definite period (stipulate period) who shall alternate the chair at meetings.

1.4. A co-chairperson may, with the consent and approval of his/her counterpart, invite any additional person(s) to attend the meeting to provide additional information and comment, but they shall not participate in the regular business of the meeting.

FUNCTIONS OF JOINT COMMITTEE

2.1. To attain the spirit of the Occupational Health and Safety Act, the functions of the Joint Committee shall be:

a) to identify, evaluate and recommend a resolution of all matters pertaining to health and safety in the workplace to appropriate senior management.

b) to encourage adequate education and training programs in order that all employees are knowledgeable in their rights, restrictions, responsibilities and duties under the Occupational Health and Safety Act.

c) The Joint Committee will address matters related to Designated Substance Regulations and WHMIS where applicable.
d) to deal with any health and safety matter that the Committee deems appropriate.

Inspections

2.2. The members of the Committee who represent workers shall designate one of the members representing workers to inspect the physical condition of the workplace, accompanied by a Management member of the Committee, not more often than once a month. The workplace inspection shall be conducted during the week following the Committee meeting.

2.3. All health and safety concerns raised during the physical inspection will be recorded on an appropriate workplace inspection form and signed by both members of the inspection team.

2.4. The workplace inspection form will be forwarded to the Joint Committee and to Senior Management within two days of the workplace inspection. Senior Management will inform the Committee of the status of the outstanding items by the next Committee meeting.

Recommendations of the Joint Committee

2.5. Senior Management will communicate in writing directly to the co-chairpersons with regard to recommendations made in the minutes of the Committee, by giving their assessment of the problem, and outlining who is responsible for resolving the matter, along with a time frame in which the matter will be resolved.

Accidents and Accompaniment

2.6. The Joint Committee will designate members and alternates if required, chosen by those they represent, to investigate all serious workplace accidents, and incidents that have the potential for a serious accident. The inspection team will be responsible for overseeing that the requirements prescribed in Section 25 and 26 of the Act and Sections 5 and 6 of the Regulations for Industrial Establishments are carried out.

2.7. The Joint Committee will designate two members and/or alternates if required, chosen by those they represent, to accompany the Ministry of Labour inspector while carrying out Ministry inspection of the workplace.
2.8. The members of the Committee representing workers shall designate a member and/or alternate(s) if required, to investigate work refusals. Senior Management and the Ministry of Labour will be informed in writing, the names of the worker(s) so designated.

**MINUTES OF MEETINGS**

3.1. The Committee will designate a secretary for the meeting, to take minutes and be responsible for having the minutes typed, circulated and filed within one calendar week of the meeting, or as the Committee may from time to time instruct. Minutes of meetings will be reviewed, and edited where necessary, by the co-chairpersons, then signed and circulated to all Committee members and a copy forwarded to Senior Management before any broader circulation takes place. Agenda items will be identified by a reference number, and be readily available in a proper filing system. Names of Committee members will not be used in the minutes except to record attendance.

**QUORUM**

4.1. The Joint Committee shall have a quorum of ______ members present in order to conduct business. One co-chairperson must be present in order to conduct business. If a co-chairperson is absent, the other co-chairperson will chair the meeting. The number of employer members shall not be greater than the number of worker members.

**PAYMENT FOR ATTENDANCE AT MEETINGS**

5.1. All time spent in attendance at Committee meetings or in activities relating to the function of the Joint Committee will be paid for at the member's current rate of pay for performing work, and the time spent is to be considered as time at work.
MEETING AGENDA

6.1. The co-chairpersons will prepare an agenda and forward a copy of the agenda to all Committee members at least one week in advance of the meeting.

6.2. The Committee may accept any item as proper for discussion and resolution pertaining to health and safety, except to amend, alter, subtract from or add to, any terms of the Collective Bargaining Agreement. All items raised from the agenda in meetings will be dealt with on the basis of consensus rather than by voting. Formal motions will not be used.

6.3. All items that are resolved or not will be reported in the minutes. Unresolved items will be noted in the minutes and placed on the agenda for the next meeting.

GENERAL

7.1. All employees will be encouraged to discuss their problems with their immediate supervisor, before bringing it to the attention of the Committee.

7.2. Committee members will thoroughly investigate all complaints to get all the facts and will exchange these facts when searching for a resolution to the problem. All problem resolutions will be reported in the minutes.

7.3. Medical or trade secret information will be kept confidential by all Committee members.

7.4. Any amendments, deletions or additions to these Guidelines must have the consensus of the total Committee and shall be set out in writing and attached as an Appendix to these Guidelines.
Signed at __________ Ontario, this _______ day of _______________, 199 .

JOINT COMMITTEE MEMBERS

FOR THE COMPANY

______________________________  ______ ________________________
______________________________  ______ ________________________
______________________________  ______ ________________________
______________________________  ______ ________________________

FOR THE UNION

______________________________
______________________________
______________________________
______________________________

__________________________
Advisor
APPENDIX C

APPENDIX D1

HEAT STRESS

The Legal Requirements:

Employers have a duty under section 25(2)(h) of the Occupational Health and Safety Act to take every precaution reasonable in the circumstances for the protection of a worker. This includes developing hot environment policies and procedures to protect workers in hot environments due to hot processes or hot weather.

For compliance purposes, the Ministry of Labour recommends the Threshold Limit Values (TLVs) for Heat Stress and Heat Strain published by the American Conference of Governmental Industrial Hygienists (ACGIH). These values are based on preventing unacclimatized workers’ core temperatures from rising above 38°C.

This Guideline is intended to assist employers, workers and other workplace parties in understanding heat stress, and in developing and implementing policies to prevent heat-related illness in the workplace.

What Is Heat Stress?

Working or playing where it is hot puts stress on your body's cooling system. When heat is combined with other stresses such as hard physical work, loss of fluids, fatigue or some medical conditions, it may lead to heat-related illness, disability and even death.

This can happen to anybody—even the young and fit. In Ontario, heat stress is usually a concern during the summer. This is especially true early in the season, when people are not used to the heat.

Heat exposure may occur in many workplaces. Furnaces, bakeries, smelters, foundries and heavy equipment are significant sources of heat inside workplaces. For outdoor workers, direct sunlight is the main source of heat. In mines, geothermal gradients and equipment contribute to heat exposure. Humidity in workplaces also contributes to heat stress.
How We Cope With Heat

Your body is always generating heat and passing it to the environment. The harder your body is working, the more heat it has to lose. When the environment is hot or humid or has a source of radiant heat (for example, a furnace or the sun), your body must work harder to get rid of its heat.

If the air is moving (for example, from fans) and it is cooler than your body, it is easier for your body to pass heat to the environment.

Workers on medications or with pre-existing medical conditions may be more susceptible to heat stress. These workers should speak to their personal physicians about work in hot environments.

Controlling Heat Stress

Acclimatization

The longer you work hard in the heat, the better your body becomes at adjusting to the heat. If you are not used to working in the heat then you should take a week or two to get used to the heat. This is called "acclimatization." If you are ill or away from work for a week or so you can lose your acclimatization.

There are two ways to acclimatize:

1. If you are experienced on the job, limit your time in hot working conditions to 50 per cent of the shift on the first day, 60 per cent of the shift on the second day, and 80 per cent of the shift on the third day. You can work a full shift the fourth day.

   If you are not experienced on the job (if you are, for example, a summer student), you should start off spending 20 per cent of the time in hot working conditions on the first day and increase your time by 20 per cent each subsequent day.

2. Instead of reducing the exposure times to the hot job, you can become acclimatized by reducing the physical demands of the job for a week or two.
If you have health problems or are not in good physical condition, you may need longer periods of acclimatization. Hot spells in Ontario seldom last long enough to allow acclimatization. However, exposure to workplace heat sources may permit acclimatization.

## Heat Stress Hazards

<table>
<thead>
<tr>
<th>Cause</th>
<th>Symptoms</th>
<th>Treatment</th>
<th>Prevention</th>
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<tbody>
<tr>
<td>Heat Rash</td>
<td>Hot humid environment; plugged sweat glands.</td>
<td>Red bumpy rash with severe itching.</td>
<td>Change into dry clothes and avoid hot environments. Rinse skin with cool water. Wash regularly to keep skin clean and dry.</td>
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<tr>
<td>Sunburn</td>
<td>Too much exposure to the sun.</td>
<td>Red, painful, or blistering and peeling skin.</td>
<td>If the skin blisters, seek medical aid. Use skin lotions (avoid topical anaesthetics) and work in the shade. Work in the shade; cover skin with clothing; apply skin lotions with a sun protection factor of at least 15. People with fair skin should be especially cautious.</td>
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<table>
<thead>
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<th>Cause</th>
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<th>Treatment</th>
<th>Prevention</th>
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<tr>
<td>Heat Cramps</td>
<td>Heavy sweating drains a person's body of salt, which cannot be replaced just by drinking water.</td>
<td>Painful cramps in arms, legs, or stomach which occur suddenly at work or later at home. Heat cramps are serious because they can be a warning of other more dangerous heat-induced illnesses.</td>
<td>Move to a cool area; loosen clothing and drink cool salted water (1 tsp. salt per gallon of water) or commercial fluid replacement beverage. If the cramps are severe or don't go away, seek medical aid. Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.</td>
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<tr>
<td>Condition</td>
<td>Symptoms</td>
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<td>Prevention</td>
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<tr>
<td>Fainting</td>
<td>Fluid loss and inadequate water intake.</td>
<td>Sudden fainting after at least two hours of work; cool moist skin; weak pulse.</td>
<td>Reduce activity levels and/or heat exposure. Drink fluids regularly.</td>
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<td>GET MEDICAL ATTENTION. Assess need for CPR. Move to a cool area; loosen clothing; make person lie down; and if the person is conscious, offer sips of cool water. Fainting may also be due to other illnesses.</td>
<td>Workers should check on each other to help spot the symptoms that often precede heat stroke.</td>
</tr>
<tr>
<td>Heat Exhaustion</td>
<td>Fluid loss and inadequate salt and water intake causes a person's body's cooling system to start to break down.</td>
<td>Heavy sweating; cool moist skin; body temperature over 38°C; weak pulse; normal or low blood pressure; person is tired and weak, and has nausea and vomiting; is very thirsty; or is panting or breathing rapidly; vision may be blurred.</td>
<td>Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.</td>
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<td></td>
<td>GET MEDICAL AID. This condition can lead to heat stroke, which can kill. Move the person to a cool shaded area; loosen or remove excess clothing; provide cool water to drink; fan and spray with cool water.</td>
<td></td>
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<tr>
<td>Heat Stroke</td>
<td>If a person's body has used up all its water and salt reserves, it will stop sweating. This can cause body temperature to rise. Heat stroke may develop suddenly or may follow from heat exhaustion.</td>
<td>High body temperature (over 41°C) and any one of the following: the person is weak, confused, upset or acting strangely; has hot, dry, red skin; a fast pulse; headache or dizziness. In later stages, a person may pass out and have convulsions.</td>
<td>CALL AMBULANCE. This condition can kill a person quickly. Remove excess clothing; fan and spray the person with cool water; offer sips of cool water if the person is conscious.</td>
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<td>CALL AMBULANCE. This condition can kill a person quickly. Remove excess clothing; fan and spray the person with cool water; offer sips of cool water if the person is conscious.</td>
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</table>
Modifying Work and the Environment

Heat exposures may be reduced by several methods. Selection of appropriate workplace controls will vary, depending on the type of workplace and other factors. Some measures may include:

**Engineering Controls**

- Control the heat at its source through the use of insulating and reflective barriers (e.g. insulate furnace walls).
- Exhaust hot air and steam produced by operations.
- Reduce the temperature and humidity through air cooling.
- Provide air-conditioned rest areas.
- Provide cool work areas.
- Increase air movement if temperature is less than 35°C (fans).
- Reduce physical demands of work task through mechanical assistance (hoists, lift-tables, etc.).
Administrative Controls

- The employer should assess the demands of all jobs and have monitoring and control strategies in place for hot days and hot workplaces.
- Increase the frequency and length of rest breaks.
- Schedule strenuous jobs to cooler times of the day.
- Provide cool drinking water near workers and remind them to drink a cup every 20 minutes or so.
- Caution workers to avoid direct sunlight.
- Assign additional workers or slow down the pace of work.
- Make sure everyone is properly acclimatized.
- Train workers to recognize the signs and symptoms of heat stress and start a "buddy system" since people are not likely to notice their own symptoms.
- Pregnant workers and workers with a medical condition should discuss working in the heat with their doctor.
- First Aid responders and an emergency response plan should be in place in the event of a heat-related illness.
- Investigate any heat-related incidents.

Personal Protective Equipment

- Light summer clothing should be worn to allow free air movement and sweat evaporation.
- Outside, wear light-coloured clothing.
- In a high radiant heat situation, reflective clothing may help.
- For very hot environments, air, water, or ice-cooled insulated clothing should be considered.
- Vapour barrier clothing, such as chemical protective clothing, greatly increases the amount of heat stress on the body, and extra caution is necessary.
Managing Heat Stress from Process Heat

For an environment that is hot primarily due to process heat (furnaces, bakeries, smelters, etc.), the employer should follow the guidance of the American Conference of Governmental Industrial Hygienists (ACGIH) as outlined in its booklet and documentation for the recommended Threshold Limit Values (TLVs), and set up a **heat stress control plan** in consultation with the workplace’s joint health and safety committee or worker health and safety representative.

Further information on the ACGIH TLVs, and on the development of heat stress control plans, may be found at the following websites:

ACGIH  
http://www.acgih.org/home.htm

U.S. Occupational Safety and Health Administration (OSHA)  
http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html

Managing Heat Stress Induced by Hot Weather

Most workplaces don't have "hot processes" but working in hot weather can pose health risks to their workers. For hot work environments due to hot weather, a hot weather plan is appropriate. A hot weather plan is a simplified heat stress control plan. A hot weather plan should establish the implementation criteria, or "triggers", to put the plan into effect. The criteria may include:

**Weather/environmental indicator triggers such as:**

- Humidex reaching or exceeding 35º Celsius
- Environment Canada Humidex advisory (air temperature exceeding 30º Celsius and Humidex exceeding 40 Celsius) or Ontario Ministry of the Environment smog alert;
- Environment Canada weather reports; and/or
- Heat waves (three or more days of temperatures of 32º or more)

Generally, plans related to hot weather should be in place between May 1 and September 30 of each year.
The following websites have information on Humidex, Weather Reports and Smog Alerts:

**Environment Canada**
http://www.msc.ec.gc.ca/

**Environment Canada Fact Sheet: Summer Severe Weather**
http://www.on.ec.gc.ca/severe-weather/summer.html

**Environment Canada Humidex Calculator**
http://lavoieverte.qc.ec.gc.ca/meteo/documentation/humidex_e.html

**Environment Canada Weather Office**
http://www.weatheroffice.ec.gc.ca/canada_e.html

**Air Quality Ontario Smog Advisories**
http://www.airqualityontario.com/

Additional information on methods to monitor and manage workplace heat exposures may be found in the following resources:

**WSIB Prevent Heat Stress**
http://www.wsib.ca/wsib/wsibsitemeefsite.nsf/Public/PreventHeatStress

**Prevention Dynamics (Ontario’s Virtual Health and Safety Portal)**
http://www.preventiondynamics.ca/
Note: Links to external websites are offered for the convenience of users in accessing related information. These links do not constitute an endorsement of the websites or their contents and the Ministry of Labour takes no responsibility for the views, contents, or accuracy of the information presented by an external website.

For further information or assistance, please contact your local office of the Ministry of Labour, the Industrial Accident Prevention Association, the Construction Safety Association of Ontario or other safe workplace associations.

Remember that while complying with occupational health and safety laws, you are also required to comply with applicable environmental laws.

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APPENDIX D2

HEAT AND COLD STRESS

HEAT STRESS

HAZARD:

Fire fighters may suffer serious injury or death due to heat stress. Heat generated within the body by work activity may not be adequately dissipated due to protective clothing. This can cause the core body temperature to rise to levels hazardous to health.

SYMPTOMS:

Excessive exposure to a hot environment can bring about a variety of health disorders and symptoms as outlined below:

1. **Heat Stroke**

Heat stroke is the most serious of the health problems that can arise when working in hot environments. It occurs when the human thermo-regulatory system simply breaks down under stress, and sweating stops. There is little warning to the victim that a crisis state has been reached.

A heat stroke victim's skin is hot, dry, and usually red or spotted. Body temperature is 40.5 degrees C or higher and rising. He is mentally confused, irritable and may complain of feeling chilled. If treatment is not received the victim may experience unconsciousness, delirium and convulsions leading to death.

First aid measures include: immediate cooling by soaking the clothes and skin in water and fanning. Immediate medical attention is also required.

2. **Heat Exhaustion**

Heat exhaustion is caused by the loss of fluid through sweating, and by the loss of salt. A worker with heat exhaustion still sweats, but experiences extreme weakness of fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit and/or lose consciousness. The skin is clammy and moist, the complexion is pale or
flushed and the body temperature is normal or slightly high. The unacclimatized, physically unfit and obese are more prone to heat exhaustion.

First aid measures include: rest in a cool place and the drinking of cool fluids. Medical treatment should be sought.

3. Fainting

A worker who is not used to hot environments and who stands erect and immobile in the heat may simply black out. This occurs because of an increased flow of blood to the skin and lower part of the body, resulting in less blood pumped to the brain.

Once lying down the worker should soon recover.

Fainting may be prevented, by maintaining movement and improved conditioning.

4. Heat Cramps

Heat cramps are painful spasms of muscles caused by low salt content and high sweat loss. The muscles of the abdomen and extremities are usually involved and pain can be great.

Heat cramps can also occur with symptoms of heat exhaustion.

Heat cramps can be relieved by rest and by replacement of salt and water. Saline may be administered by a hospital, if required.

5. Heat Rash

Heat rash, also known as prickly heat, is likely to occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. Sweat ducts become plugged, inflaming sweat glands to cause a rash. When extensive, or complicated by infection, prickly heat can be so uncomfortable as to seriously hinder a worker's performance.

Heat rash may be prevented by allowing workers to rest in a cool place at regular intervals and by taking a shower after each work shift.
6. Transient Heat Fatigue

Transient heat fatigue refers to the state of discomfort and psychological strain arising from prolonged heat exposure. Workers unacclimatized to the heat are particularly susceptible, and can suffer, to varying degrees, a decline in task performance, co-ordination, alertness, vigilance, and may become irritable and depressed.

**CONTROLS:**

It is important to modify work practices during emergency operations according to environmental conditions. The following action is recommended:

1. **Fluid Intake**

   It is extremely important to manage heat stress by encouraging fire fighters to drink cool water at the scene of an emergency and training exercises. Best results are obtained if fire fighters drink water prior to thirst because the sensation of thirst is inadequate to stimulate adequate intake of fluids.

   Firefighters exposed to high work rates and/or hot areas should make a habit of drinking fluids at least every 15 - 20 minutes. It should be noted that alcohol and caffeine beverages should be avoided before and after heat stress since both interfere with the body's water conservation mechanisms.

   Fluid loss has to be replaced to avoid impairment of bodily functions. Under a heavy work load, firefighters can perspire 0.7 to 1.0 litres or more in 30 minutes. In a 100 kg person, a perspiration loss of 1.0 L would be 1% of body mass (weight) which is a significant amount.

   Set up the water cooler early in an incident with plenty of cups and ensure personnel are drinking regularly. This is particularly important for personnel working inside a fire.
2. **Work Planning or Rotation**

In some cases, environments are just too hot to allow continuous exposure. In these cases a schedule of intermittent exposure with rest periods is necessary. This can prevent the accumulation of metabolic heat to dangerous levels and also allows the release of body heat before the person returns to the task. While the person is resting there is little metabolic heat generated and proper heat dumping procedures will allow the release of accumulated heat.

Between SCBA cylinder firefighters should remove gloves and helmets and be encouraged to drink cool fluids. After two cylinders in high heat conditions, fire fighters should be withdrawn and allowed to open coats and pants and take a break to drink plenty of cool fluids.

Personnel from other stations should be used to avoid committing the first responding crews to a long duration operation. Where manpower is limited, crews should be staged and rotated rather than committing all personnel to strenuous duties at the same time.

Consideration should be given to automatic extra alarms if the Apparent Heat Stress Index corrected by 6°C for protective clothing worn and direct sunlight exceeds 32°F. Additional manpower should be mandatory when the external Apparent Temperature exceeds 38°C. This allows for staging and crew rotation.

NIOSH stresses that air conditioning during breaks can significantly reduce recovery times. A smoke ejector placed where fire fighters can remove protective clothing, drink fluids and rest will increase evaporation of perspiration and enhance cooling and recovery.

3. **Dressing Down**

Crews should always respond to reported fires fully dressed and ready to go. Dress down as soon as it is known that protective fire fighting clothing is not needed.

It is also advisable to allow the removal of fire fighting coats during overhaul or other operations after the fire has been knocked down and no fire exposure is possible. SCBA and other protective clothing such as gloves and helmets may need to be worn.
4. **Medical Responses**

Personnel should respond to medical alarms in station uniform and helmets. No safety advantage is gained by wearing bunker gear.

5. **Grass Fires**

The decision for the level of protection required for grass fires is at the discretion of the officer in charge. Normally boots, fire resistant fatigue pants, helmets, gloves and coats (coats dependent on wind conditions) will suffice for normal grass fires. Polyester shirts offer little protection from flying embers.

Fluid replacement should be a primary consideration. Do not underestimate the wind or the potential for fire fighters to be overrun by the fire. When crews wear fire resistant station uniforms, their thermal protection is minimal compared to normal fire fighting gear.

Fire fighters should be dressed in protective clothing to allow a margin of safety. However all the previous recommendations for rotation of crews, staging, if required, and water loss replacement apply.

6. **Training**

Outdoor training exercises in high heat conditions should be curtailed, if Apparent Temperature exceeds 32°C. Consideration should be given for summer training in the morning and hall work in the afternoon. All personnel should be trained to recognize the symptoms of heat stress and the appropriate action to be taken.

**BACKGROUND:**

**One of the concerns that has gained greater attention in recent years is metabolic heat stress.** This concern has been raised because of a greater understanding of the effects of protective clothing on the human body as a result of studies conducted for improving protective clothing.
Studies that resulted from these concerns, however, actually brought about improvements in vapour barrier, station uniform and outer shell designs.

What Is Heat Stress?

There are two sources of heat our bodies must deal with, the internal source resulting from metabolic process and external source resulting from environmental causes.

The metabolic process is at a cell level and results in the continuous release of heat as the result of food being digested and the resulting energy being used to move muscles and fuel bodily functions. As body activity increases so does body temperature.

Physical conditioning has a significant bearing on an individual's reaction to heat stress. Individual susceptibility to heat may be enhanced by a large number and variety of conditions including: infection, fever, immunization reactions, vascular disease, diarrhoea, skin trauma such as heat rash or sun burn, use of alcohol within 24 hours, previous heat injury, dehydration, lack of sleep, fatigue, obesity, and drugs that inhibit sweating such as atropine, scopolamine, antihistamines, tranquilizer, cold medicines and some anti-diarrhoal medications.

In the event that a fire fighter may be unfit or overweight, the risk of heat injury may be significantly higher.

Environmental factors include the air temperature as well as thermal radiation, relative humidity, acclimatization, fire exposure and clothing.

**Thermal radiation** is the most important component of heat exposure during actual interior fire fighting operations. Heat transfer occurs between objects of different temperature via invisible infrared rays. This would occur when protective clothing is lower in temperature than a flame front.

**Relative humidity** is a contributory factor because it determines the rate of heat transfer by evaporation. When a liquid changes to vapour or steam, heat is dissipated. Examples include the cooling effect of fog streams on fire turning to steam and the cooling effect of the evaporation of sweat.

The higher the relative humidity, the less evaporation can occur to remove heat. Relative humidity is measured in terms of the amount of humidity that can be contained in the air relative to the maximum that can be contained at that temperature. For
example, if the air temperature is 16°C and the relative humidity is 50%, the air contains 1/2 of the total water vapour that it can hold at that temperature. The Steadman Apparent Temperature Index expresses the combined effect of environmental temperature and relative humidity on the body.

It should be noted that exposure to direct sunlight will also increase apparent temperature by 6°C. Protective clothing increases apparent temperature by 6°C as well.

For example if the environmental temperature is 30°C and the relative humidity is 80%, then the apparent temperature is 37°C.

Thus, the firefighter exposed to these conditions in direct sunlight would suffer the same discomfort as if the environmental temperature was 47°C (37 + 6 for sunlight + 6 for protective clothing).
### Steadman Apparent Temperature Index (Centigrade)

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<th>Dry Bulb Temperature</th>
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**Note:** Add 6°C when protective clothing is worn and add 6°C when in direct sunlight.
Acclimatization

Studies from the U.S. Army indicate the effectiveness of the sweating mechanism can be improved by exercising, in heat, for 100 minutes at least two days per week. Although significant benefits can be derived from acclimatization, our modern living style probably negatively affects our body’s heat endurance.

Fire Exposure

Obviously, fire exposures during fire fighting can subject the body to unusual heat conditions.

Class I conditions occur when a small fire is burning in a room. Environmental temperatures up to 40°C and thermal radiation up to 0.05 watts/cm² are encountered for up to 30 minutes.

Class II conditions occur in a room that has been totally involved after the fire has been knocked down. In this case, environmental temperatures from 41-95°C and thermal radiation from 0.050 - 0.100 watts/cm² are encountered for up to 15 minutes.

Class III conditions exist in a room that is totally involved. Environmental temperatures from 96-250°C and thermal radiation from 0.175 - 4.2 watts/cm² are encountered for up to 5 minutes.

Class IV conditions occur during flash-over or backdraft where environmental temperatures from 251 - 815°C and thermal radiation from 0.175 - 4.2 watts/cm² are encountered for 10 seconds.

A point of interest is the term T.P.P. that you often hear in reference to bunker outfits. Bunker outfits being purchased that conform to CGSB Standard 155.1-M88 have a Thermal Protection Performance (TPP) rating of 35. This represents a rating of heat resistance of 35 cal/cm²/sec which means it offers 17.5 seconds of protection from a 2.0 cal/cm²/sec 50%/50% radiant/convective heat flux. This represents severe and unusual exposure such as being caught inside a flash-over room or next to a flame front. In these conditions, the thermal load exceeds 300°C. The fire fighter would have 15 to 30 seconds to escape without burns.

1.0 watt/cm² = .24 cal/cm²/sec.
Clothing

Clothing inhibits the transfer of heat between the firefighter and the external environment. Whenever the external environment has a lower heat load than the body, protective clothing reduces the body's ability to cool itself via heat loss. However, when the external heat load is greater than the body, such as during actual fire fighting, the protective clothing will serve to protect the body from the heat. Fire fighting clothing interferes with heat dissipation in two ways. First, the insulation reduces heat loss by convection, conduction and radiation. Second, if clothing is not water vapour permeable (breathable), body cooling by evaporation of perspiration cannot occur. Manufacturers of protective clothing have tried to reach a balance between these opposing forces.

Limited ventilation can occur through a chimney effect when warm, moist air exits the garment via waist and neck and is replaced with cooler air from below. However SCBA straps lessen this effect.

Light coloured turnout clothing reduces the effects of radiant heat transfer from direct sunlight as long as the coats are kept clean. However light coloured clothing offers little improvement during actual fire fighting conditions.

One of the newer improvements has been in breathable vapour barriers. These new vapour barriers claim to enhance body cooling. Its effects diminish under actual fire fighting conditions and for it to remain effective in service, the coats must be kept clean.

What Is Heat Stress?

Core (deep body/organ) temperature is considered normal at 37°C. Impairment in bodily functions may develop when core temperature is sustained above 38°C.
COLD STRESS

HAZARD:

Fire Fighters may suffer injury from potential adverse effects of overexposure to cold. These exposures may occur when fire fighters are exposed to low temperatures, wind and/or moisture for significant time periods.

SYMPTOMS:

1. Frostbite

A cold-induced condition caused by the formation of ice crystals in exposed body parts. It occurs when extremities such as hands, feet, ears and nose are exposed to cold for extended periods of time.

Superficial frostbite is characterized by grey or yellowish patches on the affected areas. Deep frostbite is characterized by waxy and pale skin, the affected parts feel cold, hard and solid which may turn blue or purple upon thawing.

2. Hypothermia

A cold-induced condition which results from over cooling the body due to excessive loss of body heat.

CONTROLS:

It is important to manage cold stress by modifying work practices during emergency operations according to environmental conditions. The following measures are recommended:

1. Advise workers to:
   
   - wear multiple layers of light, loose-fitting clothing
   - pay particular attention to protecting feet, hands, face and head
   - report any cold-stress-related symptoms in themselves or their co-workers
2. **Work planning or rotation:**

In some cases the outside environment may be too cold to allow for continuous exposure. In these cases, a schedule of intermittent exposure with rest/warming periods is necessary. Try to provide a work environment for the fire fighters to rehab in. Utilize exercises to warm-up before re-exposure.
APPENDIX E

INFORMATION ALERT

LADDER FAILURE – AERIAL LADDER FIRE TRUCK

Hazard Summary:

A 1976 Pierreville aerial ladder fire truck with a 100-foot ladder, failed during a demonstration in Kelowna, B.C. The ladder had been elevated to 60 degrees from horizontal, and extended 65 feet in preparation for a firefighter to climb the rig, when the three extended sections suddenly retracted. Damage included a broken cable, two holes punched in the turntable, end stops sheared off and bent rails on the first and second sections of the ladder, and a broken shaft on the elevating mechanism. Fatal or critical injuries could have resulted if a firefighter had been on the ladder when it failed.

An engineering analysis of the failure indicated that the shaft on the elevating device had fractured, as a result of misalignment between the worm gear box and the winch drum. This misalignment had produced alternating compression and tension forces within the shaft as it was rotated, and the resulting fatigue led to crack propagation. The misalignment must have existed for some time since less than 40% of the fracture surface was fresh.

Pierreville aerial ladder fire trucks manufactured between 1974 and 1987 are most likely to have this problem.

Location(s) and Sector(s):

Municipal and Industrial Fire Services

Suggested Precautions:

Section 25(1)(b) of the Occupational Health and Safety Act requires the employer to ensure that “equipment, materials and protective devices provided by him are maintained in good condition”.

The following recommendations have been forwarded for Pierreville aerial ladder fire trucks manufactured between 1974 and 1978:

1. Eliminate the reduction in shaft diameter at the winch flange.
2. Strengthen the mechanical connection to the winch drum.
3. Design for proper alignment of the components.
4. Check alignment periodically.
5. With Pierreville aerial fire trucks manufactured between 1974 and 1978 that have not been modified, perform annual non-destructive tests on the shaft.

A new regulation for inspection, non-destructive testing and repair of aerial ladder fire trucks, in under development

**Note:** “Information Alert” is produced by the Occupational Health and Safety Branch, Ministry of Labour, for use by Ministry inspectors, health and safety associations and other interested groups or individuals in Ontario. The goal of this publication is to communicate hazard information as soon as it becomes available to prevent injury to workers. Reproduction and use of these alerts is encouraged.

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Appendix E
SELF-CONTAINED BREATHING APPARATUS CYLINDER RUPTURE

Hazard Summary:

In an event outside Ontario, a self-contained breathing apparatus (SCBA) cylinder used in the fire service ruptured while being refilled, killing one person. An Engineering analysis indicated that alloy A635 1 used in the manufacture of cylinders of the affected type is subject to sustained-load cracking in the neck area.

Affected Cylinders:

The affected cylinders are Luxfer USA cylinders manufactured from 1977 to 1984 under CTC/ DOT E-7235 pursuant to CTC Special Permit 1116 which have not been retrofitted with a steel reinforcing neck-ring. The manufacturer recalled 75,000 of these cylinders in October 1984 for installation of a steel reinforcing neck-ring, but a small number remain unaccounted for.

Location(s) and Sector(s):

Municipal and Industrial Fire Services

Suggested Precautions:

Section 25(1)(b) of the Occupational Health and Safety Act requires the employer to ensure that “equipment, materials and protective devices provided by him are maintained in good condition”.

Persons finding cylinders of this type without the required neck-ring should immediately empty them and take them out of service. The cylinders should be safely disposed of in a way that ensures they will not be used for any purpose.
Hoop-wrapped and fully-wrapped cylinders have a service life limited to 15 years or as specified by the manufacturer.

The Ministry of Consumer and Commercial Relations has asked that reports of faulty cylinders be forwarded to:

H.D. Hanrath, P.Eng.
Director, Pressure Vessels Safety Branch
Ministry of Consumer and Corporate Relations
3300 Bloor St. W.
3rd Floor, West Tower
Etobicoke, ON M8X 2X2
VEHICLE STEERING DEFECT

Hazard Summary:

A stop ball may be missing in Douglas Autotech Corporation Model 929 tilting, telescoping steering mechanisms. This defect could result in the steering shaft disengaging from the steering column, causing a complete loss of steering. A total of 8,054 vehicles may be affected.

Affected Equipment:

Fire apparatus, recreational vehicles and heavy duty trucks manufactured between August 4 and November 12, 1993, marketed under the following brand names: Caterpillar, Emergency One and Elgin Flexible, Les Autobus, Marathon, Oshkosh, Peterbilt, Pierce, Spartan, Thomas Built, VME, Volvo, and Winnebago.

Locations and Sectors:

- Municipal and industrial fire services
- Heavy industrial equipment
- Construction and mining sectors
- Transportation and tourism

Recommended Precautions:

The National Institute of Emergency Vehicle Safety (U.S.A.) recommends in bulletin #1009-3/94 that owners of vehicles that may contain the defective unit should have the vehicles inspected by an authorized dealer. Vehicles that pass the inspection will be identified by a verification sticker. Defective steering columns will be replaced without charge.
Additional information may be obtained directly from the manufacturer by calling John Kaiser or Brian Newtson, Quality Assurance Managers, Douglas Autotech, at (517) 369-2315, extension 224.
FAN BLADES IN POSITIVE - PRESSURE BLOWERS

Hazard Summary:

Positive-pressure fans or blowers are used in the fire service to ventilate smoke and heat. Recently, a few minutes after a firefighter started a gas-powered positive-pressure fan to ventilate a room, parts of the fan blade assembly broke apart. Several pieces penetrated the protective screen on the front of the fan housing and lodged in the ceiling.

Affected Fans:


Locations and Sector(s):

Municipal and industrial fire services

Suggested Precautions:

Section 25(1)(b) of the Occupational Health and Safety Act requires the employer to ensure that “equipment, materials and protective devices provided by him are maintained in good condition.”

All fans of this type should be inspected on a regular basis as recommended by the manufacturer. Fan assemblies that show cracks or other defects should immediately be taken out of service and returned to the manufacturer for repair.
FIRE VEHICLE APPARATUS: OVERLOADING AND IMPROPER WEIGHT DISTRIBUTION

Hazard Summary:

A recent Coroner’s Inquest regarding an overloaded armour truck recommended that the Ontario Fire Service be made aware of the dangers of overloading vehicles.

In several incidents, loading vehicles above their gross vehicle weight ratings (GVWR) has resulted in brake failures. An overloaded vehicle puts more stress on its braking system, causing heat build-up. When this happens, continued use may result in longer stopping distances or even brake failure.

Recommended Precautions:

When purchasing a new or used fire apparatus, carefully consider the load the vehicle will be likely to carry when first put into service and during its service life. For a new apparatus, specify a GVWR that allows for future expansion of the inventory of equipment. For a used apparatus, do not exceed the vehicle’s licensed GVWR without consulting the manufacturer.

Before adding to the inventory of a fire apparatus that is in service make sure the vehicle’s GVWR will not be exceeded. Make sure as well that the load distribution falls within Underwriters’ Laboratories of Canada (ULC) recommendations. The recommended method is to load the vehicle for intended use and have it physically weighed by Ministry of Transportation officials or at scales that can indicate weight distribution.

When a fire apparatus in service has handling or braking problems or mechanical malfunctions, or when the cause of a problem cannot be identified, investigate the apparatus for possible overloading and improper weight distribution.
Workers have found that vehicles handle better when the equipment on them is evenly distributed. Other factors that make for better handling are: proper tire size; proper tire inflation pressures; and having the right number of tires per axle relative to the weight to be carried.

References:

“Load Distribution”, ULC CAN/ULC-S515-M88 S.3.1.3
“Tire Selection and Inflation Pressures,” ULC CAN/ULC-S515-M88 S.3.7.2

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FIRE APPARATUS AERIAL LADDER’S ANCHORING BED MECHANISM METAL FATIGUE

Hazard Summary:

A worker was doing an apparatus check on the aerial ladder’s anchoring bed and found that the piston was not positioned properly. A mechanical check was done immediately and it was found that the shaft was broken in one of the hydraulic cylinders. The other cylinder's rod had a visible crack.

The break and cracks occurred in the elevation cylinder rams, about six inches above the bed (swivel base) and would not be visible without a mechanical breakdown inspection. Also, disassembly and fluorescent magnetic particle inspection of the rods would be necessary to detect some cracks.

An examination by a Professional Engineer concluded that the rod failed because of brittle fatigue. This is the result of two factors: the metal itself has poor toughness; and the design of the 90 degree corner with no radius resulted in a severe stress configuration. These two factors, combined with a potential shock loading and/or cold weather (-30°C), led to the crack which grew over time.

The engineer's report also advised that the failure was a result of poor manufacturing procedure and the selection of a brittle fracture-susceptible material.

The components were manufactured by a company now out of business, Thibault, and were installed on a Thibault Aerial Ladder Serial Number T86-139.

Location and Sectors:

Fire departments with Thibault Aerial Ladders, and especially those located in localities that require equipment use during severe cold weather.
Precautions:

When inspecting this equipment, workers should be able to inspect it visually and know the location of the cylinders when it is maintained in good condition. This information should be recorded so that it can be checked by any worker who wants to identify any discrepancies in the alignment.

Any discrepancies are to be investigated by a licensed mechanic through disassembly for a visual inspection of the cylinder rods and, where necessary, appropriate fluorescent magnetic particle inspection
Note: Such disassembly is not a normal part of an annual or five year NFPA 1914 test program.

Suitable repairs can be accomplished by replacement with new rams and blocks for the elevation cylinders to meet the original design capacities of the equipment.

Recommendation:

Any fire department with this type of equipment that experiences heavy use, particularly in extremely cold climates, should consider a specific inspection program that incorporates disassembly by a mechanic.

Remember that while complying with occupational health and safety laws, you are also required to comply with applicable environmental laws.
VEHICLE - MOUNTED AERIAL DEVICES

Hazard Summary:

Two workers were injured when the bucket of an aerial device in which they were working swung out over a roadway. A passing transport truck struck the device. The equipment was an aerial ladder with an attached personnel platform, and with upper and lower controls.

The device involved in the accident had been re-mounted onto a chassis that was different from the original, and it had not been re-certified by a professional engineer. The Ministry of Labour investigated the accident and ordered that a professional engineer certify the device. The Ministry also issued orders for maintenance records, a maintenance tag, and an operator's manual.

If a chassis is changed, or any other modifications are made that may affect the structural and/or mechanical integrity of the device, and it is not re-certified, WORKERS ARE AT RISK!

The Ministry believes that some units in service have either not been certified or re-certified. This includes re-sale units.

Certification may result in:

- down-rating the capacity,
- the addition of limit switches,
- limitations being placed on the use.
Sectors and Locations:

These devices are widely used in work operations covered by the Construction Regulations, or, in other particular work, by the Industrial Regulations.

Sign erection, traffic signal construction and maintenance, and certain utility work are operations commonly performed using this type of equipment.

Recommended Precautions:

The owner of an aerial device must ensure that:

the device is mounted on a chassis that is specified by the manufacturer of the device, and that the device is certified by a professional engineer in accordance with National Standards of Canada standard CAN-CSA-C225-M88:

- a modified device is re-certified;
- there are inspection and maintenance records; and
- a maintenance and inspection record tag is provided near the operator's station.

The Regulations for Construction Projects (Ontario Regulation 213/91) apply. Section 144, subsections (4), (5), and (6) set out the standards for certification. Section 145, subsections (2) and (3) set out the standards for maintenance records, and section 146 requires an inspection tag.

As part of the current review of the construction regulations, an amendment to section 144 is being proposed that would require that a certification or re-certification document be with the device at all times.

For further information, please contact the Construction or Industrial Health and Safety Program, at the nearest Ministry of Labour office.

Remember that while complying with occupational health and safety laws, you are also required to comply with applicable environmental laws.
APPENDIX F

Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008
Preventing and Assessing Occupational Exposures to Selected Communicable Diseases: An Information Manual for Designated Officers, 1994
Post-exposure Prophylaxis (PEP) for Human Immunodeficiency Virus (HIV), 1999
Exposure of Emergency Service Workers to Infectious Diseases Protocol

Preamble

The Ontario Public Health Standards (OPHS) are published by the Minister of Health and Long-Term Care under the authority of the Health Protection and Promotion Act (HPPA)\(^1\) to specify the mandatory health programs and services provided by boards of health. Protocols are program and topic specific documents which provide direction on how boards of health must operationalize specific requirement(s) identified within the OPHS. They are an important mechanism by which greater standardization is achieved in the province-wide implementation of public health programs.

Protocols identify the minimum expectations for public health programs and services. Boards of health have the authority to develop programs and services in excess of minimum requirements where required to address local needs. Boards of health are accountable for implementing the standards including those protocols that are incorporated into the standards.

Purpose

The purpose of this protocol is to ensure that:

- Emergency service workers (ESWs) are notified by the medical officer of health or designate, in the event that s/he may have been exposed to an infectious disease of public health importance, so that appropriate action can be taken.
- Designated officers are able to obtain advice from boards of health through the medical officer of health or designate regarding possible exposure(s) of ESWs to infectious diseases of public health importance.

This protocol replaces the roles, responsibilities, and requirements of boards of health found in the Notification of Emergency Service Workers Protocol, 1994.

This protocol does not address requirements of boards of health under the Mandatory Blood Testing Act, 2006 (MBTA)\(^2\), which is administered by the Ministry of Community Safety and Correctional Services. This protocol addresses responsibilities of boards of health with regard to notifying ESWs of possible exposures to infectious diseases of public health importance where:

- Diseases are not limited to those named under the MBTA\(^2\) (it is currently restricted to hepatitis B, hepatitis C and HIV); or
- An ESW has not made an application under the MBTA\(^2\); but the board of health and/or medical officer of health or designate suspects that an ESW may have been exposed to an infectious disease of public health importance.

Reference to the Standards

The table below identifies the OPHS standard and requirement to which this protocol relates.

<table>
<thead>
<tr>
<th>Standard</th>
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<td>Infectious Diseases Prevention and Control</td>
<td>Requirement #7: The board of health shall ensure that the medical officer of health or designate is available on a 24/7 basis to receive reports of and respond to infectious diseases of public health importance in accordance with the Health Protection and Promotion Act; the Mandatory Blood Testing Act; the Exposure of Emergency Service Workers to Infectious Diseases Protocol, 2008 (or as current); the Infectious Diseases Protocol, 2008 (or as current); the Institutional/Facility Outbreak Prevention and Control Protocol, 2008 (or as current); and the Public Health Emergency Preparedness Protocol, 2008 (or as current).</td>
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1) Operational Roles and Responsibilities

a) The board of health shall have an on-call system for receiving and responding to reports of infectious diseases of public health importance on a 24 hours per day, 7 days a week (24/7) basis.

b) The board of health shall ensure that the medical officer of health or designate is available on a 24/7 basis to receive and respond to reports of infectious diseases of public health importance in accordance with this protocol to ensure that:

i) Reports of a possible exposure of an ESW are received, assessed, and responded to as soon as possible, but not later than 48 hours (depending on situation and disease, response may be required sooner) after receiving notification; and

ii) Reports of all infectious diseases of public health importance are received and assessed, with particular consideration given to potential exposures of ESWs.

c) The board of health shall contact emergency services in their health unit and request that they identify designated officers for their respective emergency service (i.e., police, firefighters, ambulance) in order to facilitate the exposure notification process.

d) The board of health* shall advise designated officers in their health unit regarding the possible exposure of an ESW to an infectious disease of public health importance when made aware by:

i) Having the medical officer of health or designate actively seek out contacts of cases with infectious diseases of public health importance, even if a designated officer has not contacted the medical officer of health or designate regarding the possible exposure and no application has been made by an individual under the MBTA;

ii) Informing the respective designated officer that an ESW might have been exposed to an infectious disease of public health importance during his/her work. This is not dependent on laboratory confirmation – e.g., the case can exhibit clinical signs and symptoms of a particular infectious disease; and

iii) Informing the designated officer regarding any specific actions to be taken based on the designated officer’s report, including advising ESWs to seek medical attention and the initiation of post-exposure prophylaxis if applicable.

e) When a designated officer makes an incident report of a possible exposure to an infectious disease of public health importance to the board of health, the board of health shall:

i) Review and assess the information provided;

ii) Contact health care facilities and other persons (e.g., infection control practitioners and/or attending physicians) to obtain additional information on the specific case, as necessary, based on the assessment of the incident by the medical officer of health, or designate; and

iii) Inform the designated officer as soon as possible and no later than 48 hours after receiving notification (depending on the disease) of advised actions to be taken, including accessing medical care by the ESW.

- Advice shall include, but is not limited to assessing the possible risk of occupational exposure and setting standards of practice, appropriate use of personal protective equipment, training for employees to prevent possible exposures; and
- Follow up with the designated officer to ascertain what action has been taken.

f) In the event that there is a disagreement between the designated officer and the medical officer of health or designate regarding a possible exposure, the designated officer may refer the matter to the Chief Medical Officer of Health or designate.

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*A decision by the board of health to contact the designated officer can be made on a case-by-case basis, based on clinical assessment which could include, but is not limited to degree of risk, type of exposure, etc.
Glossary

**Designated officer**: A person identified in an emergency service (i.e., police, firefighters, ambulance) who is responsible for receiving and assessing reports regarding the possible exposure of an emergency service worker to an infectious disease of public health importance and then contacting the medical officer of health or designate.

**Emergency service worker**: A person working in an emergency service (i.e., police, firefighters, ambulance).

**Infectious diseases of public health importance**: Diseases include, but are not limited to, those specified reportable diseases as set out by O. Reg. 559/91 (as amended) under the HPPA, and include zoonotic diseases.

References

Preventing and Assessing Occupational Exposures to Selected Communicable Diseases

An Information Manual for Designated Officers

Ministry of Health
©Ontario

November 1994
Prepared by the Ontario Ministry of Health
with the assistance of the Designated Officers Manual Working Group
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INTRODUCTION

Emergency service workers - ambulance attendants, paramedics, firefighters and police officers - may in the course of their duties be exposed to communicable diseases, including:

- bloodborne diseases, such as hepatitis B and acquired immune deficiency syndrome (AIDS)
- diseases spread through the respiratory system, such as meningococcal disease and infectious tuberculosis
- viral haemorrhagic fevers, such as Lassa fever, Marburg virus haemorrhagic fever, Ebola virus haemorrhagic fever, Crimean-Congo haemorrhagic fever, and Venezuelan haemorrhagic fever.

The risk of spread of all these diseases can be reduced through the use of health and safety programs designed to protect workers from exposure. Such programs should be in place in all hazardous workplaces.

Some emergency service workers, such as ambulance attendants and paramedics, are trained to recognize and deal with the risks of exposure to communicable diseases. Firefighters and police officers, who are not considered health care workers, may not have received the same training. However, they are often called upon to react and provide the first level of care in working environments that are often uncontrolled and in situations where they may risk their own safety to protect others. Within this working environment, it is possible for emergency service workers to be exposed to a communicable disease and to be unaware they have been exposed. It is also possible for private citizens or off-duty emergency service workers to act as "good Samaritans" in an emergency situation and be exposed to these communicable diseases.

This manual is part of a Ministry of Health initiative to:

- educate emergency service workers about the risk of occupational exposure to the communicable diseases specified above
- encourage emergency service workers to adopt practices and procedures to protect themselves
- establish a protocol for dealing with any exposure.

BACKGROUND

In November 1987, the Centers for Disease Control (CDC) in the United States developed and published the Recommendations for Prevention of HIV Transmission in Health Care Settings, which the Federal Centre for AIDS and the Laboratory Centre for Disease Control (LCDC) in Canada endorsed.

In 1988, the CDC issued its "Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus and Other Bloodborne Pathogens in Health Care Settings". This document dealt in more detail with the use of protective barriers, gloves and waste management. LCDC again endorsed the CDC's recommendations.

In November 1991, a Ministry of Health Task Force recommended that:

"to reduce the risk of occupational exposure... universal precautions be adopted and used in all health care settings and with all procedures where there is risk of exposure"

Universal precautions is a process of assessing the risk in a given activity or situation, and then taking steps to reduce the risk. In some cases, that may mean using protective equipment, such as gloves or masks, or changing procedures, such as the way workers handle sharp objects. Universal precautions focuses on giving workers the information, skills, procedures and equipment they need to identify risks and how to take steps to protect themselves and prevent exposure.
When a worker is in a work situation where he/she might have been exposed - for example, having a patient's blood splashed in his/her face - the worker should report the incident so the employer can ensure the worker receives proper care and counselling.

Over the last few years, hospitals and other controlled health care settings have adopted systems of universal precautions designed specifically to prevent the transmission of bloodborne diseases in those settings. They also use other prescribed systems of infection control to prevent the transmission of other diseases.

However, universal precautions can also be used by emergency service workers to protect themselves in emergency situations and thus reduce the risk of exposure to all the communicable diseases listed on the first page. The universal precautions described in this manual may differ somewhat from those used in hospital settings because they are designed for use in emergency settings.

To help prevent exposure to and transmission of communicable diseases in emergency settings, the Ministry of Health is encouraging all emergency services to adopt the universal precautions described in this manual.

GUIDING PRINCIPLES FOR UNIVERSAL PRECAUTIONS IN EMERGENCY SITUATIONS

1. All workplaces are expected to have in place standard occupational health and safety programs and practices.

2. A system of universal precautions complements existing occupational health and safety practices.

3. Universal precautions is designed to be used "universally" and routinely in all emergency situations where there is risk of exposure to the specified communicable diseases (bloodborne diseases, diseases spread through the respiratory system and viral haemorrhagic fever).

4. The employer is responsible for assessing the potential risk of occupational exposure to the specified communicable diseases in the workplace and for providing appropriate engineering controls, standards of practice, equipment and education to reduce the risk.

5. Universal precautions give the worker the knowledge and skills to assess personal risk in emergency situations and to take precautions to protect himself/herself. The employer is responsible for providing the education and training that will give employees the skills to apply universal precautions appropriately in all situations. The employee will then be able to use his/her skills to reduce the risk and prevent exposure.

6. Immunization is a key strategy in preventing transmission of certain communicable diseases. All emergency service workers should be immunized according to the National Advisory Committee on Immunizations’ (NACI) guidelines published in the Canadian Immunization Guide (Health Canada) 1993.

7. An emergency service worker who has had an occupational exposure to one of the specified communicable diseases has the right to know she/he has been exposed, and will be informed.

8. Emergency service workers who have had a possible occupational exposure to any of the specified communicable diseases should follow the protocols described in this manual. The protocols respect the provisions for confidentiality in the Health Protection and Promotion Act (HPPA) Section 39.
PROTOCOLS FOR NOTIFICATION OF EMERGENCY SERVICE WORKERS

When emergency service workers are exposed to a communicable disease, they should be notified so they can receive care and, if infected, take steps to prevent spreading the disease to others. However, in an emergency situation, neither the employer nor the employee will necessarily know if the employee has been exposed to a communicable disease.

In any health care situation, a patient has a right to confidentiality. Hospital staff cannot breach the confidentiality of a person brought in by emergency workers by telling the workers anything about the patient's health or giving them any details of the person's diagnosis.

To ensure that emergency service workers are notified of a possible exposure without breaching the patient's right to confidentiality, the Ministry of Health has worked with the emergency services to:

- develop a mandatory public health guideline and protocols for notifying any emergency worker who has been exposed to a communicable disease
- encourage each emergency service to establish a designated officer who will be trained to assess significant occupational exposures to the specified communicable diseases and who will work with public health to notify workers
- develop a manual the designated officer can use to fulfil his/her duties.

Purpose

The purpose of the mandatory public health guidelines and protocols is to ensure that emergency service workers are notified of specific serious communicable disease exposures so that appropriate action may be taken.

Roles and Responsibilities

**The Emergency Service**

Within a jurisdiction, each emergency service (police, firefighters, ambulance) will be responsible for:

- assessing the possible risk of occupational exposure and then setting standards of practice, providing equipment and training employees to prevent possible exposures
- appointing no more than one designated officer and an alternate who will assess exposure reports and notify employees of a possible exposure. Whenever possible, this appointment will be made in consultation with the Joint Health and Safety Committee. Emergency services employing small numbers of people may band together to appoint and ensure the training of a designated officer
- completing the Workers’ Compensation Board forms (Employer's Report of Injury/Disease Form 7) required to document an exposure (See Appendix 1).

**The Emergency Service Worker**

The emergency service worker plays a key role in preventing exposures and in ensuring any possible exposure is followed up on immediately by:

- being aware of the risks of occupational exposure to the specified communicable diseases
- taking steps in fulfilling his/her duties to prevent or reduce the risk of exposure by using universal precautions and appropriate procedures and equipment routinely
- complying with the Occupational Health and Safety Act and any other established workplace health and safety policies.
If a situation occurs where an emergency service worker may have been exposed to a communicable disease, he/she is responsible for:

- complying with the recommended protocol and promptly reporting the possible exposure, using the same Workers’ Compensation Board forms (Worker's Report of Injury Form 6) that would be used with any other occupational injury (See Appendix 1)
- providing any other information the designated officer may need to assess the incident.

**The Designated Officer**

The designated officer will:

- receive detailed reports from emergency service workers who believe they may have been exposed to one of the specified diseases (The reports will describe the situation and circumstances clearly.)
- assess, given the situation and circumstances, whether an exposure could have occurred
- an exposure could have occurred, contact the medical officer of health in the health unit where the emergency service is located and provide all details of the incident
- inform any worker who has had contact with someone with one of the specified communicable diseases of the possible risk and advise them to seek medical care.

*In the event that there is a disagreement or dispute between the designated officer and the medical officer of health about a possible exposure, the designated officer may refer the matter to the Chief Medical Officer of Health.*

**The Medical Officer of Health**

The medical officer of health will play an active role in helping the designated officer assess possible exposures and providing any information the designated officer may need to inform a worker about any specific actions he/she should take.’ The medical officer of health will:

- contact the emergency services in his/her region to identify their designated officers
- review detailed information on any incidents provided by the designated officers
- contact a specified hospital contact person (infection control practitioner) for information on the case if she/he agrees that the worker may have been exposed and, if it is necessary
- inform the designated officer as soon as possible (not later than two working days after receiving the request) of any specific action that should be taken
- follow-up to ensure proper procedures were used.

In addition, the medical officer of health will continue to play a proactive role in disease surveillance. There are established policies and procedures for reporting cases of designated reportable communicable diseases and notifying contacts.

- Physicians and others designated under the Health Protection and Promotion Act (BPPA) are required to report cases of designated communicable diseases (OR 558/91, OR 559/91).
- When the medical officer of health receives such a report he/she or his/her designate will immediately take steps to inform people who may have had contact with the person and been exposed -including emergency service workers -and advise them to see a doctor.
- The medical officer of health will actively seek out possible contacts - even if no report has been filed by an emergency service worker or designated officer. This is routine with illnesses spread by the respiratory route such as meningococcal meningitis. People exposed to a case are then given antibiotics to prevent infection.
The medical officer of health will also contact anyone exposed to someone with active tuberculosis, determine whether she/he has been infected, and ensure she/he receives appropriate treatment.

Under the contingency plan for viral haemorrhagic fevers, the medical officers of health, with the provincial response coordinator, are responsible for responding to any reported case of one of these fevers. They will identify, notify and manage everyone who may have had contact with someone with such a disease. They will assess emergency service workers in accordance with the contingency plan.

Under the Health Protection and Promotion Act, the medical officer of health also has the authority to order anyone who has a communicable disease to:

- submit to an examination by a physician
- if the disease is considered "virulent", place himself/herself under the care and treatment of a physician
- conduct himself/herself in such a manner as not to expose another person to infection isolate himself/herself and remain in isolation from other people.

SELECTING/TRAINING A DESIGNATED OFFICER

To fulfill the role described above, the designated officer must have the following knowledge and skills:

**Knowledge**

The most important part of the job is to understand how the specified diseases are spread. The designated officer must be familiar with:

- **The diseases**, including:
  - the agents (e.g., virus) that cause them
  - where the agents are commonly found (e.g., blood)
  - objects or surfaces in the environment that can play a role in the spread of the specified diseases
  - how the agents can be spread in an emergency situation
  - how long it takes to develop signs or symptoms of the disease (incubation period) when people are most likely to be infectious (i.e., when the disease is communicable or the stage in the disease when it is most easily spread)
  - whether the worker is susceptible (likely to get the disease) or has a natural or acquired resistance to the disease.

- **Vaccines and immunizing agents** that can prevent the spread of the specified diseases.

- **Precautions and barriers** that workers can use to reduce the risk of being exposed to the specified diseases.

**Skills**

In addition to knowledge about the diseases, how they are spread and how to prevent them, the designated officer will need the following skills to use that knowledge effectively:

- **Assessment Skills.** The designated officer must be able to:
  - review reports and ensure they have all the facts needed for analysis
  - talk to/interview the emergency service worker to ensure that critical information in the written report is correct
• **Analytical Skills.** The designated officer must be able to:
  
  – evaluate both the written reports and his/her conversations with a worker to assess whether the worker has been exposed to one of the specified communicable diseases act quickly and properly (based on the information he/she has)
  – use other resource materials
  – ask for other advice (when needed).

• **Interpersonal Skills.** The designated officer must be able to:
  
  – talk easily with co-workers
  – explain the results of his/her assessment in a reassuring way
  – relieve any unnecessary anxiety that workers may be feeling
  – give some emotional support to a co-worker who may have been exposed to one of the specified communicable diseases.

• **First Aid Skills.** The designated officer must have:
  
  – training and experience in giving first aid (if a firefighter or police officer) some health care training (if an emergency medical attendant).

• **Accountability.** The designated officer will be accountable for ensuring the protocol is followed and, in his/her role, must be willing to:
  
  – take responsibility for contacting the medical officer of health
  – take responsibility for telling workers and superiors of his/her findings.

In selecting people to act as designated officers, the emergency services should consider those who have already demonstrated these types of skills in other work situations. The emergency service should also consider the training the designated officer may need to develop the information and skills he/she will need to do the job. The following section provides the basic information the designated officer will need.
THE DISEASES AND HOW THEY ARE SPREAD

**Bloodborne Diseases**

Bloodborne diseases, such as AIDS and hepatitis B, are caused by viruses that are carried in the bloodstream and in other body fluids, including semen, vaginal secretions and saliva. People carrying these viruses may show no signs of illness. For example, hepatitis B carriers are people who are infected and have not developed an immunity to the disease. They will carry small amounts of hepatitis B virus in their bloodstream and other body fluids, perhaps for the rest of their lives and thus be able to pass the virus to others. The same is true of people with HIV (human immunodeficiency virus) infection, the virus that causes AIDS.

It is often difficult, in an emergency situation, to determine whether a body fluid contains blood - or even what type of fluid it is. For this reason all body fluids, whether blood is visible or not, should be treated as potentially infectious. There is greater risk of transmission with certain blood borne diseases. For example, hepatitis B virus is significantly more infectious than HIV.

**Transmission.** In an emergency situation, all workers are at risk of exposure to bloodborne diseases through:

- a needlestick injury or puncture wound -if an emergency worker is pierced or stabbed with a needle or sharp instrument that has someone's blood on it, there is a risk that he/she could be exposed to a bloodborne disease
- broken skin -if an emergency worker has a cut or wound or his/her skin is chapped, abraded, weeping or covered with a rash or eruption and the cut or skin comes in contact with blood or bloody body fluid, there is a risk that she/he could be exposed to a blood borne disease
- the mucous membranes of the eye, nose or mouth -if blood or bloody body fluids are splattered in an emergency service worker's eyes, nose or mouth, there is a risk that she/he could be exposed to a bloodborne disease
- surfaces contaminated with blood -there is some risk of exposure from infected blood spilled or splattered on floors or other surfaces. However, the HIV/hepatitis B virus in a blood spill can be easily and quickly killed by wiping or disinfecting the area with a mixture of household bleach and water (1:10)
- saliva - if saliva from an infected person gets on broken skin or in an emergency worker's eyes or mouth, there is some risk of exposure to hepatitis B virus. To date, there has been no documented case of any health care or other worker getting HIV through contact with saliva

The risk will vary depending on the situation, the type of care being provided and the type of contact. For example, the risk of a virus being passed from one person to another is much greater with a needlestick injury than with contact with broken skin or mucous membrane.

Specifically, ambulance attendants who administer hypodermic injections are at risk 'of exposure to bloodborne diseases through needlestick injury. Police officers risk skin injury and possible exposure to bloodborne diseases when they search prisoners or people who have been arrested. Hypodermic needles or other sharp objects contaminated with blood may be hidden in pockets, purses, waistbands or garment linings. Police officers also risk exposure to hepatitis B if they are bitten by someone carrying the hepatitis B virus.

There is no risk of emergency workers being exposed to blood borne diseases in faeces, urine or vomit - unless they contain blood. Bloodborne diseases are not spread by casual contact on the job, in the swimming pool or on the subway. There is no risk of becoming infected by sharing a locker or toilet facilities, or by being in a car with someone with a bloodborne illness.
**Symptoms.** People infected with a bloodborne disease will not necessarily develop symptoms of illness for some time. In the case of hepatitis B, about half the adults who become infected never feel sick and recover completely. The other half get a flu-like illness and their skin and eyes turn yellow. Of those infected with hepatitis B, about six to 10 per cent will go on to become chronic carriers of the disease.

In the case of HIV, people infected may develop a flu-like illness and recover and remain well for many years. Physicians use an antibody test to find out whether someone exposed to HIV has become infected - but it can take from three to six months to develop antibody to HIV. Because of the time it takes for people to develop antibody, emergency service workers who may have had a possible exposure may have to wait several months to know whether or not they are infected.

**Immunization.** Three doses of hepatitis B vaccine administered over a six month period, following the NACI guidelines, is the best available protection against the hepatitis B virus. It is effective in over 95 per cent of cases. This means the vast majority of workers who have been vaccinated against hepatitis B are immune and will not get hepatitis B when exposed to the virus.

There is no vaccine against HIV infection.

**Tuberculosis (TB)** is caused by bacteria called *Mycobacterium tuberculosis.* The bacteria are carried in the respiratory system of infected people and can be spread in respiratory droplets from the person coughing, sneezing or even talking. The droplets can survive suspended in the air for several minutes.

**Transmission.** TB is not a highly infectious disease. To be infected, people usually have to be exposed frequently over a long period of time to someone with TB in the lungs who is not receiving treatment, whose sputum contains TB bacteria, and who is coughing. Infection occurs when the person inhales the airborne bacteria and the bacteria take hold and grow in the person's lungs. The bacteria are not spread through sharing dishes, drinking glasses or other objects.

In an emergency situation, emergency service workers are at greatest risk of exposure to TB through:
- giving mouth-to-mouth resuscitation
- close and prolonged contact with someone who is coughing uncontrollably - particularly in a confined or closed space, such as a car or ambulance, where there is poor air circulation
- contact with fellow workers who may unknowingly be infected with TB. When the infected worker coughs, sneezes and speaks at close range with a co-worker - particularly in a car or an office with poor ventilation - here is risk of exposure to the bacteria.

**Symptoms.** Symptoms of active TB in the lungs include cough, fever, sweating and weight loss. It takes approximately four to 12 weeks after a worker is exposed to TB for a skin test or chest X-ray to show signs of infection.

**Prevention/Treatment.** Emergency services workers who are exposed to people known or suspected to have TB can prevent transmission by using appropriate precautions as advised by infection control officers. For example, when transporting someone with active TB in their lungs, the emergency service workers should ask the person to cover his/her mouth with a tissue when coughing and to put used tissues into a covered container.

Physicians use a combination of drugs over a period of six to nine months to treat active tuberculosis. This treatment is effective and will cure TB in most cases. Most patients become noninfectious within three weeks of beginning treatment. If a worker suspects that he/she has been infected with tuberculosis, he/she should have a skin test and be examined by a physician. Anyone who reacts to the skin test (i.e., is infected) and who has not developed active TB can be given medication that will prevent TB from developing.
Meningococcal disease is caused by bacteria called Neisseria meningitidis. Two serious forms of meningococcal disease are meningitis and meningococcaemia. Meningococcal meningitis occurs when the bacteria infects the membrane that surrounds the brain and spinal cord and causes inflammation. Meningococcaemia occurs when the bacteria gets into the bloodstream.

Transmission. About five per cent of the population - or one of every 20 people - carry the bacteria that causes meningococcal disease in their nose and throat without becoming ill. The disease is usually transmitted by people who are carriers, not people who are ill, and it is spread through direct contact with the discharges from the nose and throat of a carrier. The bacteria can be spread through kissing or by sharing a drinking cup, a cigarette, food or lipstick. There is no risk from sitting next to someone who carries the bacteria. The disease occurs most often in winter and spring. It is not known why some people become ill and others do not.

Meningococcal disease occurs at all ages. About one-third of cases are in adults, and the spread of the disease is more common among adults living in crowded conditions, such as prisons and military barracks. However, most adults have acquired a natural immunity to the disease. In most people, the chance of becoming infected is low and it usually decreases with age. Emergency services workers are rarely at risk even when caring for people who have meningitis.

In an emergency situation, emergency service workers may be exposed to the bacteria through mouth-to-mouth resuscitation without a mouthpiece, but there is no known case of an emergency worker being infected in this way.

Symptoms. Once infected with meningococcal bacteria, it takes between one and 10 days usually less than four days - to develop symptoms, which include fever, intense headache, nausea, vomiting, stiff neck and often a rash. The person may become delirious or lapse into a coma.

Treatment/Immunization. Emergency service workers who have had close contact with a case of meningococcal disease (i.e., given the person mouth-to-mouth resuscitation without a mouthpiece) are given a two-day course of antibiotic. This will prevent them from developing the disease.

There is a vaccine for meningococcal disease, but it is usually given only to travellers going to parts of the world where the disease is common. In Canada, it has been used only when there is an outbreak.

Viral Haemorrhagic Fevers

The diseases that cause viral haemorrhagic fevers, such as Lassa fever, Marburg virus haemorrhagic fever, Ebola virus haemorrhagic fever, Crimean-Congo haemorrhagic fever, and Venezuelan haemorrhagic fever are spread by direct contact with someone who is infected.

Although these diseases are very rare, they are serious and require the involvement of both provincial and federal health authorities. When a case of viral haemorrhagic fever is identified, everyone who may have been exposed to the case will be contacted by provincial or local health authorities. The local medical officer of health will initiate actions as outlined in the Contingency Plan for Viral Haemorrhagic Fevers (Ontario 1994).
2 PRECAUTIONS TO REDUCE THE RISK OF TRANSMISSION

Emergency service workers can prevent or reduce the risk of occupational exposure to the specified communicable diseases by having up to date immunizations, by following safe work procedures and by using barrier devices and other equipment.

The following are guidelines for immunization against communicable diseases. When appropriate, employers should ask emergency service workers to show their record of immunization, and encourage anyone who has not been appropriately immunized to get the necessary vaccines. Except for the hepatitis B vaccine, all are available free from family physicians or public health departments.

**Immunization**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Immunization Details</th>
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<tr>
<td>Tetanus-Diphtheria</td>
<td>Like all adults, emergency service workers should be immunized against tetanus-diphtheria once every 10 years. If, in the course of his/her duties, an emergency service worker receives either a puncture wound or a wound other than a clean minor one and it is five years or more since his/her last inoculation, she/he should have a booster dose of vaccine.</td>
</tr>
<tr>
<td>Polio</td>
<td>Routine immunization against polio is not considered necessary for adults living in Canada. Most adults are already immune and have a very low risk of exposure to wild polio viruses in North America. However, immunization is recommended for health care workers in close contact with people who may be excreting wild or vaccine strains of polioviruses, and some employing agencies may require polio vaccinations. Emergency service workers who need to be immunized and who have not received a primary course of oral poliomyelitis vaccine (OPV) and/or inactivated poliomyelitis vaccine (IPV) should be given a primary course with IPV</td>
</tr>
<tr>
<td>Rubella (German measles)</td>
<td>Female emergency service workers who have no documented history of vaccination with rubella vaccine or who test negative for rubella antibody should receive rubella vaccine. Female workers should be advised to avoid pregnancy for three months after vaccination.</td>
</tr>
<tr>
<td>Measles</td>
<td>People born after 1956 and who have no documented record of measles immunization or who are, known to be seronegative should receive measles vaccine (given as MMR).</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>A safe vaccine to prevent hepatitis B has been available since 1982, and provides over 95 per cent protection against hepatitis B for seven or more years. Emergency service workers who, in the course of their duties, are exposed to blood or at risk of sharps injury should receive a primary course of hepatitis B vaccine (one series of three inoculations) in accordance with the NACI recommendations. (See Appendix II.)</td>
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Emergency service workers who are trained and knowledgeable about universal precautions should routinely use the following safe work procedures:

**Safe Work Procedures**

<table>
<thead>
<tr>
<th>Procedure</th>
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<tbody>
<tr>
<td>Handwashing</td>
<td>Hands should be washed after any contact with a client, even if gloves have been worn, using the following procedures: wet hands first, dispense soap from container, wash lds with warm water and lots of friction - lather and scrub for approximately 10 to 15 seconds - rinse well under running water, keeping hands down, dry hands with a clean paper towel and use the towel to turn off the faucets.</td>
</tr>
<tr>
<td>In many emergency situations, there will be no handwashing facilities and it will not be possible for emergency service workers to wash immediately. In those cases, emergency service workers should use waterless antiseptic hand cleanser and follow the manufacturers’ instructions. They should then wash their hands again with soap and water as soon as possible.</td>
<td></td>
</tr>
</tbody>
</table>
**Gloves.** Disposable medical gloves should be worn whenever there is risk of exposure to blood, other body fluids (vomit, diarrhea) or rashes (open sores, wounds). Change gloves as soon as they become torn or soiled. Change gloves between handling different people at the emergency scene if possible. After use and before leaving the scene, put them back in their original packaging and return them to the office/centre for proper disposal. Avoid touching personal items, such as combs, when wearing gloves. Wash hands as soon as possible after removing gloves.

**Masks and Protective Eyewear.** Masks and protective eyewear should be worn when there is a risk that the emergency service worker may be splashed with blood or body fluids.

**Handling Sharps.** Avoid contact with any sharp object or instrument, including needles. Handle them only when using the appropriate type of heavy glove. Any sharp objects should be carefully disposed of in properly designed puncture-resistant containers. Puncture wounds pose a particular hazard for emergency service workers in uncontrolled settings.

**Resuscitation Procedures.** Use proper resuscitation equipment - bag-valve masks, oxygen demand valve resuscitators, pocket mouth-to-mouth resuscitation masks - when someone in an emergency situation requires resuscitation.

**Cleaning, sterilizing and disinfecting.** Any clothing splattered with blood or other body fluids should be handled as little as possible and washed in a normal laundry cycle, using laundry detergent. Station and work uniforms should be washed and dried according to instructions on the labels.

Any equipment used, such as resuscitation masks, should be cleaned and disinfected as instructed by the manufacturer. Any blood or other body fluid spills on equipment or vehicles should be cleaned with cleaners or disinfectants intended for environmental use.

When cleaning blood or body fluid spills on floors or other surfaces, emergency service workers should wear disposable gloves, wipe up the fluid using disposable towels, then decontaminate the area with an appropriate germicide or 1:10 solution of bleach and water. Let the area air dry. Wash hands after removing gloves.
REPORTING AND ASSESSING A POSSIBLE EXPOSURE

Any emergency service worker who believes that she/he may have been exposed to one of the specified diseases should report the incident promptly to the designated officer using the prescribed form (see Appendix III). The worker should provide detailed information on the emergency situation, the precautions and equipment used, any failure in the equipment and any other information the designated officer may need to assess the situation.

Reporting a Possible Exposure

When a worker reports a possible occupational exposure, the designated officer is then responsible for assessing the situation and determining whether an exposure may have occurred.

To determine whether an exposure has occurred, the designated officer will assess:

- the nature of the exposure
- the worker's immune status
- the precautions used during the incident
- the body fluids the worker was exposed to
- the length or duration of the contact or exposure any other available information

The designated officer will answer the following questions:

How did the exposure occur?

- needlestick/punctured by sharp object
- splashed in the eye by (type of body fluid)
- laceration of the skin
- splashed in the mouth by (type of body fluid)
- non-intact skin exposed to (type of body fluid)
- close contact with someone with a cough, possibly TB
- close contact with someone suspected of having meningococcal disease
- confined in an enclosed area (e.g., vehicle, aircraft) with someone who was coughing giving mouth-to-mouth resuscitation to someone without using a mouthpiece human, animal or insect bite
- shared drinking glasses and other utensils
- other (describe in detail)

What is the worker's immune status?

Are his/her immunizations up-to-date for:

- tetanus and diphtheria
- polio
- Rubella
- measles
- measles

Has she/he received a full course of hepatitis B vaccine?

- When did she/he receive the last dose of hepatitis B vaccine?
- Was serology testing done to determine that she/he responded to the vaccine? When was the last testing done for antibody?

What barrier precautions did the worker wear or use during the incident?

- goggles
- gloves
- apron or protective clothing
- mask
- others (describe in detail)

Are the barriers intact? (e.g., Were the gloves torn? Did any body fluids soak through the apron?) If worker did not use barrier precautions, why not?
What body fluids were the worker exposed to?

- blood
- wound drainage
- vomitus
- saliva
- faeces
- urine

How long was the contact/exposure?

(e.g., the worker was in the same aircraft or vehicle for hours; the worker was soaked with [type of body fluid] for at least [length of time] before washing it off)

What other information is available that will help assess exposure?

(e.g., suspected diagnosis of the contact; location of the exposure, such as a crack house, shooting gallery, homeless shelter, centre for the developmentally challenged, animal shelter or place with pets, school for children, rock concert hall)

4 WORKING WITH THE MEDICAL OFFICER OF HEALTH

When the designated officer believes an emergency service worker may have been exposed to one of the specified communicable diseases, he/she will call the medical officer of health and discuss the specifics of the case. If the medical officer of health agrees that an exposure is possible, he/she will gather other information pertinent to the incident. This may involve contacting the infection control practitioner in a local hospital.

As soon as practicable - no later than two working days after receiving the request of the designated officer - the medical officer of health will inform the designated officer of any specific action that should be taken. The medical officer of health will not give the designated officer any personal information, such as the parent's name or diagnosis. He/she will simply tell the designated officer that, based on the information he/she has been able to gather, the recommended course of action that the emergency service worker should follow.

5 NOTIFYING EMERGENCY SERVICE WORKERS OF A POSSIBLE EXPOSURE

It is then the designated officer's responsibility to notify the emergency service worker/s of the possible exposure, advise them about the steps they should take, answer any questions they may have and encourage them to seek proper medical care and counselling.

If the emergency service worker has been exposed to HIV, the designated officer should inform him/her about the National Surveillance of Occupational Exposure to the Human Immunodeficiency Virus (HIV) and provide the appropriate forms. (See Appendix 4.) The surveillance program is designed to monitor the occurrence of occupational exposures and determine the risk of acquiring HIV infection in an occupational setting. To register in the program, an emergency service worker who has had a possible exposure to HIV must be tested for antibody to HIV within one week of the incident, and then monitored over the next 12 months. As of July 1, 1993, a total of 542 Canadian health care workers had registered with the program and none has gone on to develop HIV infection. (For more information, contact the Laboratory Centre for Disease Control at (613) 957-0172.)

Workers who do not want to participate in the national surveillance program should be monitored by their physicians.
6 THE ASSESSMENT PROCEDURE AND PROTOCOL IN ACTION

The hazard or risk of exposure to these specified communicable diseases depends on:

- the job or service the emergency worker is providing
- the type and length of contact he/she has with an infected person
- whether or not the worker has been immunized and used safe practices and appropriate equipment.

Here are two scenarios that illustrate how the designated officer would assess a situation.

A police officer is dispatched late at night to a motor vehicle collision. When she arrives, she finds an overturned vehicle in the ditch with a seriously injured and unconscious female trapped inside and an injured male several metres away. The officer immediately calls for an ambulance and the volunteer fire department with the "jaws of life."

The officer checks the woman's condition and finds she is breathing but has obvious compound fractures in one arm and one leg. The man has serious head injuries and is bleeding profusely. In checking the man, the officer gets blood on her hands. She is not wearing disposable medical gloves but as soon as she is able to -within an hour of the incident -she washes her hands thoroughly using soap and water.

The ambulance arrives and the attendants provide care to the accident victims. While looking for some identification, an ambulance attendant is stuck by a needle that was in the man's pocket, and then notices; needle tracks on the man's arms.

The volunteer fire department arrives and firefighters work to get the woman out of the car. In the process, one of them cuts his hand and needs medical treatment.

In this situation, who is at risk and to what degree?

Assessment. When the emergency service workers returned to their agencies, they completed the Worker's Report of Injury Form 6, providing information about the incident. The designated officer, using the prescribed assessment form, reviewed the incident reports and interviewed the workers to gather any other necessary information about the accident and the practices used. Based on that information, the designated officer made the following risk assessments:

- The police officer did get blood on her hands and she was not wearing gloves. However, the skin on her hands was intact, she washed her hands thoroughly after the incident, and she had been vaccinated against hepatitis B.
- The volunteer firefighter was cut and, given there was blood at the scene, was at some slight risk of exposure to hepatitis B. Unfortunately, he had not taken advantage of the free hepatitis B immunization program offered by the fire department.
- The ambulance attendant received a needlestick injury - and is at greatest risk of the three to an exposure to a bloodborne disease. The attendant was immunized against hepatitis B within the last two years and was known to have responded to the vaccine. However, he may have been exposed to HIV.

In the case of the police officer, the designated officer determined there was no exposure, but encouraged the police service to provide its officers with disposable medical gloves and appropriate training.

Action. With the firefighter, the risk of exposure in this incident was relatively low. The designated officer contacted the medical officer of health to discuss the incident. They agreed that the volunteer firefighter should be counselled about the possible risk of exposure to hepatitis B in his work, as well as the importance of immunization. The designated officer met with the worker and recommended that he immediately seek medical care and consider inoculation with hepatitis B immune globulin (HBIG) and, at the same time, begin a regular series of hepatitis B vaccine.
Although the ambulance attendant was protected against hepatitis B, he was at risk of exposure to HIV. The designated officer contacted the medical officer of health to report and discuss the exposure. The medical officer of health contacted the infection control practitioner at the hospital for information on the patient's health status. The hospital confirmed that the patient does have HIV. The medical officer of health then contacted the designated officer with that information. During the conversation, the medical officer of health did not reveal any personal or identifying information about the patient.

The designated officer then met with the ambulance attendant. Without revealing any personal information about the person at the scene of the accident, he informed the attendant about the exposure and the risks associated with it. He was able to tell the ambulance attendant that there was a risk, but that, in the national surveillance program, no health care worker exposed to HIV from a needlestick injury has developed the disease. He then recommended that the worker seek medical care and counselling that will help him deal with the stress and also ensure that he does not inadvertently pass the virus to others during the time he is waiting to see if he is infected. He also encouraged the worker to register in the national surveillance program.

The designated officer then ensured that the employer completed all relevant Workers' Compensation Forms (e.g., the Treatment Memorandum Form, the Employer's Report of Accidental Injury or Industrial Disease and the Employer's Subsequent Statement Form).

In the few days following the incident, the designated worker followed up with the firefighter and ambulance attendant to ensure they were following the prescribed procedures. During that same period, the medical officer of health also contacted the designated officer to ensure that the appropriate steps had been taken.

II. Student Collapses

Ambulance attendants respond to a call from a local high school. A 19-year-old boy collapsed suddenly after a football game. The attendants find him unconscious, cold and clammy to the touch with a non-palpable pulse. One attendant gives the boy mouth-to-mouth resuscitation without using a mouthpiece. The team then hooks the boy up to a ventilator in the ambulance and transports him to the hospital. The trip takes about five minutes.

The following afternoon, the hospital isolates Neisseria meningitidis in the boys blood, confirms a diagnosis of meningococcal infection Type C, and notifies the local medical officer of health. The medical officer of health then proceeds to contact people who could possibly have been exposed. She calls the designated officer for the ambulance service to discuss the case.

In this situation, what is the risk?

Assessment The designated officer contacted the ambulance attendants and asked them to complete the incident report forms and provide information on the situation. Using the prescribed assessment form, she reviewed their reports and then interviewed them for specific details on the incident.

She learned that the attendant who gave mouth-to-mouth resuscitation did not use a mouthpiece. Based on this evidence, she determined that the ambulance attendant was exposed to meningococcal bacteria through contact with saliva during the mouth-to-mouth resuscitation.

Action. She contacted the medical officer of health to report her findings. He corroborated her assessment and recommended that the ambulance attendant be referred to a physician for treatment with antibiotics (e.g., Rifampin). The designated officer then met with the attendant to tell him of the exposure, explain the value of the two-day antibiotic treatment, and discuss signs, symptoms and usual incubation period for meningitis so the attendant can react quickly if he becomes ill. With the ambulance attendant's permission, the designated officer then contacts, by phone or in writing, the worker's physician to provide details of the incident and ensure the physician understands the steps required. A few days later, the designated officer checks with the ambulance attendant to, ensure he has taken the appropriate steps.
Conclusion

With this manual and the protocol, emergency service agencies have an opportunity to reduce the risk of exposure to communicable diseases in emergency situations and to ensure workers are informed of possible exposures so they can take steps to safeguard their health.

The Ministry of Health strongly encourages all emergency service agencies to appoint a designated officer, to use the protocol and recommended procedures and forms, and develop an effective working partnership with their local medical officer of health. This, combined with the use of universal precautions, will make the working environment safer and healthier.
# Workers' Compensation Board Report Forms

## Preventing Assessing Occupational Exposures to Selected Communicable Diseases

### MESSAGE TO WORKER:

Please use dark ink. When you have filled out this report, immediately return it to the WCB. If you do not return this report to the WCB you will delay compensation payments, your right to rehabilitation services, and other benefits.

Personal information relating to you will be collected throughout your claim under the authority of the Workers' Compensation Act, and will be used to administer your claim and programs of the Board. Medical and non-medical information is collected from health care providers, vocational agencies, employers and witnesses. Information may be disclosed to the accident employer, external medical, rehabilitation, safety agencies and others as authorized by the Workers' Compensation Act and the Freedom of Information and Protection of Privacy Act. For information about the collection, and availability of this form to your employer, contact the

### Worker Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>Care of Injury</td>
</tr>
<tr>
<td>To Ensure, Contact</td>
<td>( )</td>
</tr>
</tbody>
</table>

Ce formulaire est disponible en français sur demande.

### Health Care

Where were you first treated for your injury/disease? (first aid at work, clinic, hospital, emergency, family doctor, chiropractor)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of First Treatment</td>
<td>Day</td>
</tr>
<tr>
<td>Name and address of person treating you now</td>
<td></td>
</tr>
</tbody>
</table>

If you have been referred to any health care specialist (physiotherapist, chiropractor, surgeon), give name(s).

### Earnings Information

Your employer reported your earnings to the WCB on the Form 7. Please review the information in section F of your copy of the Employee's Report of Injury/Disease, Form 7. If you disagree with the earnings information provided by your employer, or if you wish to add more information, please provide details. Attach a letter of explanation and/or a pay stub to this form, if applicable.

### Employment Benefits

Check the employment benefits provided or contributed to on your behalf by your employer:

- Health
- Life
- Pension

Do you contribute to your employment benefits? Yes No

Please read and complete the back of this form.
Workers Name | Social Insurance Number | WCB Claim Number

Details of Injury/Disease

Date and Hour of Injury: (Month, Day, Year) a.m. p.m.
Date and Hour Reported to Employer: (Month, Day, Year) a.m. p.m.
Who did you report the injury/disease to?

1. What happened to cause your injury/disease? If known, describe injury, part of body involved and specify left or right side.

2. If you did not report your injury/disease immediately, why did you delay in reporting your injury/disease?

3. Describe your activities at the time of the injury/disease. Include details of equipment or materials you used and the size and weights of objects you handled.

4. Where were you when the injury/disease occurred? If your injury/disease occurred outside Ontario, specify province, state or country.

5. Did anyone else witness or know about your injury/disease? If so, provide details below.

Have you ever had a similar injury/disease? [ ] no [ ] yes
If yes, provide details in the space below. If the previous injury was work-related, include prior WCB claim number, if known. If additional space is needed, attach a letter.

<table>
<thead>
<tr>
<th>Date of Injury</th>
<th>Type of Injury</th>
<th>Name &amp; Address of your employer at the time of previous injury, if applicable</th>
<th>Claim Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

| Have you returned to any work, with or without pay, since your injury/disease? [ ] no [ ] yes |

Are you a member of a trade union? [ ] no [ ] yes
If yes, do you authorize the trade union to represent you in matters before the Workers' Compensation Board? [ ] no [ ] yes
If yes, give the name and telephone number of union.

It is an offence to deliberately make false statements to the WCB.
I consent to the collection of all information relating to this claim by the WCB. I declare all of the information in this report to be true and I claim benefits under the Workers' Compensation Act.

Signature: ____________________________ Date: ____________

In accordance with the Freedom of Information and Protection of Privacy Act, your employer can obtain a copy of this form from the WCB.
**APPENDIX 2**

**Hepatitis B Vaccine**


**Hepatitis B Vaccines** contain purified HB sAg and induce anti-HB’s production, which confers immunity to hepatitis B. Hepatitis B vaccines are licensed in Canada for pre-exposure and post-exposure prophylaxis. Antigenic subtypes of HBV exist but immunization confers immunity to all subtypes because of the presence of a common antigen. Two types of vaccine have been licensed in Canada.

**Two Recombinant DNA Hepatitis B Vaccines** are licensed in Canada, one prepared by Merck Sharp and Dohme (Recombivax HB) and the other by SmithKline Beecham (Engerix-B). Both vaccines are produced from a genetically engineered yeast strain. Recombivax contains 10 µg/mL and Engerix 20 µg/mL of purified hepatitis B surface antigen. A special preparation of Recombivax HB containing 40 µg/mL is available for use in hemodialysis patients. The vaccines are absorbed onto aluminum hydroxide with thimerosal as preservative. Contaminating yeast antigens are present in the vaccines in small amounts but no increase in yeast antibody titres has been observed following administration of either vaccine. The vaccines are well tolerated and reactions are usually mild.

**Plasma-Derived Hepatitis B Vaccine** consists of purified formalin-inactivated, alum absorbed HBsAg prepared from the plasma of human carriers. The plasma derived vaccine is not currently available in Canada.

The recommended schedule for hepatitis B vaccine is three doses given at 0, 1 and 6 months. An alternative four-dose schedule for the use of Engerix-B at 0,1,2 and 12 months may result in a more rapid antibody response but has not been shown to confer better protection against disease. Other schedules are also being investigated.

The dose of vaccine administered varies with age, product used and in some medical conditions.

Interruption of the immunization schedule does not require that any dose be repeated. If any dose has not been given on schedule, it should be given at the first opportunity, with the proviso that the third dose is given a minimum of 3 to 5 months after the second dose to ensure a good immune response. Vaccines produced by different manufacturers can be used interchangeably.

**Hepatitis B Immune Globulin (HBIG)** is prepared from pooled human plasma from selected donors with a high level of antibody to hepatitis B surface antigen (anti-HBs) and seronegative for HIV. The manufacturing process inactivates HIV. HBIG provides effective short-term passive immunity. HBIG administered concurrently with vaccine, but at a different site, does not interfere with the antibody response.

All hepatitis B vaccine should be injected into the deltoid muscle of children and adults, and into the anterolateral thigh muscle of infants. Gluteal administration should not be used because of an impaired immune response, possibly the result of inadvertent deposition into fatty tissue. Use of vaccine that has been frozen or inadequately mixed has also led to poor antibody responses.

Immune responses following intradermal injection have been variable and this route of vaccine administration is not recommended.
**Response Rate to Immunization**

Use of the recommended schedule and routes of immunization results in seroconversion rates of 90% to 95% in immunocompetent individuals. The antibody response rate is lower in immunocompromised patients, such as those infected with HIV (50% to 70%), in renal failure (60% to 70%), with diabetes mellitus (70% to 80%), and those with chronic liver disease (60% to 70%). Vaccination of smokers produces lower antibody titres compared to nonsmokers. Antibody response is age related. Children between age 2 and 19 years have the highest response rate (99%), while children <2 years of age have a 95% response rate. The response rate decreases in individuals >19 years: 20 to 29 -95%, 30 to 39 -90%, 40 to 49 -86%, 50 to 59 -71 % and 60 and over 50% to 70%.

**Recommended Usage**

Hepatitis B prevention should include programs for universal immunization of children, pre-exposure vaccination of high risk groups, universal screening of all pregnant women for HBsAg, and post-exposure intervention for those exposed to disease, particularly infants born to HBV-carrier mothers.

**High-Risk Prophylaxis**

Pre-exposure prophylaxis with hepatitis B vaccine is recommended for those persons who are at increased risk of infection, namely, those exposed frequently to blood or blood products and body fluids that may contain the virus. Since the risk of exposure varies in different settings, it is recommended that institutions or jurisdictions review their own situation in order to develop their own priorities for immunization.

The following persons are considered to be at increased risk and should be vaccinated.

1. Persons with occupational risk, including health care workers and embalmers who are exposed to blood or blood products or at increased risk of sharps injury. Students in these occupations should complete their vaccine series before possible occupational exposure to blood or sharps injuries.

   Hospital employees who have no contact with blood or blood products are at no greater risk than the general population.

2. Residents and staff of institutions for the developmentally challenged.

3. Sexually active homosexual or bisexual males.

4. Heterosexual males or females with multiple sexual partners or with a recent history of a sexually transmitted disease.

5. Injection drug users.

6. Haemophiliacs and others receiving repeated infusions of blood or blood products.

7. Hemodialysis patients.

8. Inmates of long-term correctional facilities.

9. Household and sexual contacts of HBV carriers.

10. Populations or communities where HBV is highly endemic (e.g., some native populations in Labrador and the Northwest Territories).

11. Children <7 years of age whose families have immigrated to Canada from areas where there is a high prevalence of hepatitis B, and who may be exposed to HBV carriers through their extended families.

12. International travellers to hepatitis B endemic areas who will reside in the area longer than 6 months, or shorter term travellers who are likely to have contact with blood from, or sexual contact with, residents in areas with high levels of endemic disease.
Non-household contacts, including children in child-care settings, need not be considered for vaccination. However, if a HBV-infected child is placed in a child-care setting and has behaviour problems such as biting and scratching, or if special medical conditions exist, such as severe weeping skin disease, vaccination of contacts should be discussed with public health officials.

Percutaneous (“needlestick”) or Mucosal Exposure: The table on the next page outlines management of vaccinated or unvaccinated individuals after potential exposure to hepatitis B. Following percutaneous, ocular or mucous membrane exposure to blood or body fluids, it is necessary to determine, if possible, if the source of the contaminated material is HBsAg positive. It is also important to ascertain whether the exposed individual has received a full and properly administered course of hepatitis B vaccine and/or whether the anti-HBs antibody level has been previously determined. Unless testing has demonstrated the presence of adequate levels of anti-HBs within the past 24 months, a serum sample should be obtained before any immunobiologics are administered. An adequate level of antibody is considered to be >10 international units per litre (IU/L) of anti-HBs.

If a partially immunized individual is exposed to an HBsAg-positive source, one dose of HBIG should be administered if anti-HBs levels are inadequate or cannot be measured within 48 hours. The vaccination series should be completed.

If the source of the contaminated material is unknown or cannot be tested, management should be based on a risk assessment in consultation with a physician or public health authority and the course of action outlined in the table. Even if the source of the contaminated materials is hepatitis B negative, vaccination should be initiated if the exposed person is at continuing risk of hepatitis B infection.

Sexual and Household Contacts of Hepatitis B: Sexual partners of an acute case of hepatitis B should begin a hepatitis B vaccine series. If prophylaxis can be started within 14 days of the last sexual contact with the HBV infected person, a single dose of HBIG (0.06 mL/kg) should also be given.

HBIG and vaccination are not indicated for non-sexual household contacts of an acute HBV case except for infants <12 months of age when the mother or primary caregiver has acute infection or for persons with identifiable exposure to the case's blood, such as occurs with shared toothbrushes or razors.

All sexual and household contacts of chronic "carriers should be vaccinated.

Sexual Assault Victims: The assessment of a sexual assault victim should include determining the anti-HBs status of the victim and, if possible, the HBsAg status of the alleged assailant. Subsequent management should then follow the table. Administration of HBIG should prevent the development of HBV infection if the alleged assailant is HBsAg positive. However, if HBIG is not administered, the victim should also be tested for HBsAg and repeat tests should be performed at 6 to 12 weeks to determine if hepatitis B infection develops.

Evaluation must also include assessment for other sexually transmitted diseases, psychologic effects of the assault and pregnancy.
### Course of Action following percutaneous ("needlestick") or mucosal exposure to hepatitis B virus

<table>
<thead>
<tr>
<th>Vaccination Status</th>
<th>Anti –HBs Level</th>
<th>HbsAg Positive</th>
<th>Unknown Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposed Person</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Source</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinated</td>
<td>&gt; 10 IU/L</td>
<td>no action</td>
<td>no action</td>
</tr>
<tr>
<td></td>
<td>documented</td>
<td>necessary</td>
<td>necessary</td>
</tr>
<tr>
<td></td>
<td>within the</td>
<td>no action</td>
<td>no action</td>
</tr>
<tr>
<td></td>
<td>previous 2 years</td>
<td>necessary</td>
<td>necessary</td>
</tr>
<tr>
<td></td>
<td>≥ 10 IU/L</td>
<td>assess anti-HBs level; if ≥ 10 IU/L</td>
<td>assess anti-HBs level; if ≥ 10 IU/L</td>
</tr>
<tr>
<td></td>
<td>documented</td>
<td>no action; if &lt; 10 IU/L</td>
<td>no action; if &lt; 10 IU/L</td>
</tr>
<tr>
<td></td>
<td>more than 2 years</td>
<td>give single booster</td>
<td>give single booster</td>
</tr>
<tr>
<td>Known non-responder (anti -HBs level &lt; 10 IU/L after vaccination)</td>
<td>HBIG#+</td>
<td>HBIG #+</td>
<td>no action necessary +</td>
</tr>
<tr>
<td>level unknown and unable to be determined within 48 hours</td>
<td>HBIG#+ single booster</td>
<td>single booster + HBIG#</td>
<td>no action necessary</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>≥ 10 IU/L</td>
<td>no action</td>
<td>no action</td>
</tr>
<tr>
<td></td>
<td>no action</td>
<td>necessary</td>
<td>necessary</td>
</tr>
<tr>
<td></td>
<td>level unknown at hours or &lt; 10 IU/L</td>
<td>HBIG#+ full vaccine course</td>
<td>full vaccine course</td>
</tr>
<tr>
<td></td>
<td>full vaccine course</td>
<td>HBIG#</td>
<td>full vaccine course</td>
</tr>
</tbody>
</table>

*If source is known to be HBsAg negative, no action is required unless exposed person requires initiation of vaccination series.

#Hepatitis B immune globulin 0.06 mL/kg preferably given within 48 hours of exposure. Efficacy decreases with time and is unknown after 7 days.

+If exposed person has received only three vaccine doses, an additional three - dose series may be administered.

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### Booster Doses Of Vaccine

Routine booster vaccinations in immunocompetent persons are not recommended based on current evidence which shows continuing protection. However, the studies of protective efficacy are ongoing and will determine if booster doses of vaccine might become necessary in the future.

Immunocompromised persons often respond suboptimally to the vaccine. Subsequent HBV exposures in these individuals can result in disease or the carrier state. Therefore, boosters may be necessary in this population. The optimal timing of booster doses for immunocompromised individuals who are at continuing risk of HBV exposure is not known and should be based on the severity of the compromised state and annual monitoring for the presence of anti-HBs.
Pre-vaccination Serologic Screening for Antibody: Routine pre-vaccination serologic testing for antibody, either for anti-HBs or anti-HBc, is not recommended. There is no medical indication for these tests and they would only be cost effective for populations in which a substantial proportion of persons have anti-HBs and consequently do not need vaccine.

Post-vaccination Serologic Tests: Post-vaccination tests for anti-HBs in healthy persons are not normally recommended provided the vaccine was administered properly. The seroconversion rate with hepatitis B vaccines in such people is usually 90% or more.

There are, however, a few exceptions. Post-vaccination testing is recommended for steady sexual partners of HBV carriers and may be considered for immunocompromised patients and persons who by reason of age or disease status, may be expected to have a lower seroconversion rate.

Post-vaccination testing for anti-HBs may also be considered for persons at high risk of occupational exposure to hepatitis B since knowledge of initial antibody response (i.e., responder or non-responder) helps determine appropriate post-exposure prophylaxis. In considering postvaccination testing for persons at high risk, a careful assessment of the degree of occupational risk must be made which reflects the population served, work activities and the likelihood of needlestick injury.

Post-vaccination testing, when indicated, should be performed 1 to 6 months after completion of the vaccine series.

For non-responders to three doses of vaccine, an additional three-dose series will produce a response in 50% to 70%. Individuals who fail to respond after the second three-dose immunization

Side effects reported among vaccine recipients to date have usually been mild, transient and generally limited to soreness and redness at the injection site. There is no epidemiologic evidence to associate the chronic fatigue syndrome with hepatitis B immunization.

Reactions and Pregnancy should not be considered a contraindication to use of vaccine for persons in whom immunization is otherwise recommended. Furthermore, acute hepatitis B in a pregnant woman may result in severe disease for the mother and chronic infection of the infant. Data are not available on the safety of these vaccines for the fetus. However, the risk is expected to be negligible since the vaccines consist of non-infectious subunits.

Adverse reactions have not been observed when hepatitis B vaccines have been given to persons who are immune to hepatitis B or who are hepatitis B carriers.
APPENDIX 3
Designated Officer – Incident Assessment Form

1. How did the exposure occur?
   - needlestick/punctured by sharp object
   - splashed in the eye by ________________________________ (type of body fluid)
   - laceration of the skin splashed in the mouth by ________________________________ (type of body fluid)
   - non-intact skin exposed to ________________________________ (type of body fluid)
   - close contact with someone with a cough, possibly TB
   - close contact with someone suspected of having meningococcal disease
   - confined in an enclosed area (e.g., vehicle, aircraft) with someone who was coughing
   - giving mouth-to-mouth resuscitation to someone without using a mouthpiece
   - human, animal or insect bite
   - shared drinking glasses and other utensils [describe in detail]

2. What is the worker's immune status? Are his/her immunizations up-to-date for:
   - tetanus and diphtheria
   - polio
   - measles
   - rubella
   - Hep B
   - When did she/he receive the last dose of hepatitis B vaccine? ________________
   - Was serology testing done to determine and she/he responded to the vaccine? Yes No
   - When was the last testing done for antibody? ________________

3. What barrier precautions did the worker wear or use during the incident?
   - goggles
   - mask
   - gloves
   - apron or protective clothing
   - others [describe in detail]:
   - Are the barriers intact? (e.g., were the gloves torn? did any body fluids soak through the apron?) ________________
   - If worker did not use barrier precautions, why not? ________________
4. What body fluids was the worker exposed to?
   - blood
   - wound drainage
   - vomitus
   - saliva
   - faeces
   - urine

5. How long was the contact/exposure? (e.g., the worker was in the same aircraft or vehicle for # hours; the worker was soaked with [type of body fluid] for at least [length of time] before washing it off)

6. What other information is available that will help assess exposure? (e.g., suspected diagnosis of the contact; location of the exposure, such as a crack house, shooting gallery, homeless shelter, centre for the developmentally challenged, animal shelter or place with pets, school for children, rock concert hall)
APPENDIX 4

National Surveillance of Occupational Exposure to HIV Incident Report

To follow
UPDATE
December 1999

Post-exposure Prophylaxis (PEP) for Human Immunodeficiency Virus (HIV)

This update on PEP should replace section #5 (page 16) in the Information Manual for Designated Officers titled "Notifying Emergency Service Workers of a Possible Exposure." Ensure this document remains attached with the manual at all times.

It is important that a thorough assessment of risk for occupational exposure to HIV takes place. In the majority of instances PEP will not be required. The following reflects the advances that have been made in post-exposure prophylaxis.

Note: PEP for any exposed worker should be started within hours of exposure preferably within one hour. Under these circumstances the Designated Officer should refer the exposed emergency services worker to the nearest hospital with a functioning emergency department.

__________________________________________

Contact with HIV

If an emergency worker has sustained an exposure to the blood or body fluids from a patient who has AIDS or who tests positive for HIV antibody:

➢ The emergency service worker should be counselled about the risk of becoming infected (currently estimated as 0.3% for percutaneous exposure and 0.09% for mucous membrane exposure) and the implications for his/her behaviour in the follow-up period. “Factors associated with HIV transmission include a deep injury, device visibly contaminated with the source patient’s blood, procedures involving a needle placed directly in a vein or artery, and terminal HIV illness in the source patient.” These exposures involve a larger volume of blood and/or a higher titre of HIV.

➢ The option of enrolling in the National Surveillance Program administered by the Bureau of HIV/AIDS, STD and Tuberculosis, Laboratory Centre for Disease Control, Health Canada. Phone: (613) 957-1813) should be discussed.

If the emergency services worker does not want to be enrolled in the federal surveillance program:

➢ He/she should be offered baseline testing for HIV antibody status in his/her blood drawn within 1 week of the incident. Without baseline data, any future claim for compensation for occupationally-acquired HIV illness could be jeopardized;

➢ The exposed worker should be screened for HIV antibody at 6 and 12 weeks, and at 6 months and their confidentiality must be protected.

__________________________________________

Post-Exposure Prophylaxis

Retrospective case-control data published by the Centers for Disease Control and Prevention (CDC) suggests that the post-exposure use of zidovudine (AZT) may be protective for health care workers (HCWs.). After significant occupational exposure to HIV which carries a risk for transmission of HIV, anti-retroviral PEP is recommended.

PEP regimens should include a basic regimen of AZT 300 mg 2 times a day and lamivudine (3TC) 150 mg 2 times a day for 4 weeks, and an expanded regimen adding a protease inhibitor (e.g. indinavir 800 mg every 8 hours for 4 weeks) to the basic regimen for high risk exposures. The choice of regimen is dependent on the nature and risk of the exposure as follows:

**Assessment of Risk for Percutaneous Occupational Blood Exposure to HIV for PEP**

**Highest risk:** BOTH a larger volume of blood (e.g. deep injury with large diameter hollow needle previously in source patient's vein or artery, especially involving an injection of a source patient's blood) AND blood containing a high titre of HIV (e.g. source with acute retroviral illness or end-stage AIDS).

**Increased risk:** EITHER exposure to larger volume of blood OR blood with a higher titre of HIV.

**No increased risk:** NEITHER exposure to a larger volume of blood NOR blood with a high titre of HIV (e.g. solid suture needle injury from source patient with asymptomatic HIV infection).

The potential benefits and risks of anti-retroviral agents should be discussed with the exposed emergency service worker. If the emergency service worker is pregnant, the discussion should also include potential benefits and risks for the fetus.

If the decision is made to give prophylaxis, it must be started within hours of exposure, preferably within one hour. The interval after which there is no benefit from PEP is undefined. Hospitals with emergency departments have established a system and protocol to provide counselling and prophylactic therapy at all times.

- If the exposed emergency service worker is positive for HIV antibody during baseline testing they should be given appropriate counseling and a medical referral.

- If seroconversion occurs during the follow-up period after a documented exposure to HIV this should be reported to the Workplace Safety and Insurance Board and local Medical Officer of Health.

- If an emergency service worker has sustained an exposure to the blood or body fluids from a patient who has clinical or epidemiological risk for HIV infection and who refuses to allow testing of his/her blood.

  - The exposed emergency service worker should be offered a follow-up program similar to that outlined previously for an exposure to the blood or body fluids from a patient who has AIDS or who tests positive for HIV antibody.

(Note: The exposed worker cannot be enrolled in the federal surveillance program which is restricted to those who have exposure documented to HIV)
MISCELLANEOUS

Ministry of Labour Health & Safety Contact Centre
Section 21 Blank Comment Form
Ministry of Labour Health & Safety Contact Centre

Ontario has launched a new toll-free number – 1-877-202-0008 – to report workplace health and safety incidents or unsafe work practices.

On November 1, 2010, the Ministry of Labour launched a Health & Safety Contact Centre, which allows anyone, anywhere in Ontario to call one number to report a workplace health and safety incident, critical injury, fatality or work refusal. The public can also call that number if they suspect unsafe work practices or for general inquiries.

The number operates 24 hours a day, seven days a week.
## FORM FOR COMMENTS ON SECTION 21 DRAFT DOCUMENTS

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<td>Ministry of Labour</td>
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<td>505 University Avenue, 19th Floor</td>
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<td>Toronto, Ontario</td>
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<td>Fax: (416) 326-7745 Joe.O'<a href="mailto:Grady@ontario.ca">Grady@ontario.ca</a></td>
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| Note: Comments submitted must be on this form with all areas completed. |
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| Comments must be submitted by the | |

| Required date of: | |
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| Additional Comments: | |
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Form for Comments on Section 21 Draft Documents
Effective: January 2007
Revised: February 2012