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Emergency Planning for Public Safety Communicators

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Answering the Call

**EMERGENCY PLANNING
FOR PUBLIC SAFETY COMMUNICATORS**





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FOR PUBLIC SAFETY COMMUNICATORS

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Introduction

Disasters are the ultimate test of ability, training and preparedness for emergency response services. In the past Canadians experienced disasters such as the Saguenay Flood (Québec), 1995, the 1997 Red River (Winnipeg) Flood, the Ice Storm of 1998 that effected southern Ontario, Québec and some Maritime provinces, the 1998 wild land fire season that saw approximately 12,000 people evacuated from their homes throughout the province of BC; Silver Creek Fire (Salmon Arm) 7,500 evacuees, Greenstone Mountain Fire (Kamloops) 600 evacuees, Fintry Fire (Vernon) 50 people evacuated Knox Mountain Fire (Kelowna) 40 people evacuated, Chu Chua Native Band (Barriere) 60 people evacuated. The Québec town of Lac-Mégantic, was the site of a train derailment on July 6, 2013, when a 74-car freight train carrying crude oil derailed, resulting in a fire and explosion of a number of tank cars. The result was 47 people dead and most of the downtown area was destroyed.

Generally most people who do not work or have anything to do with emergency services on a day-to-day basis have little or no understanding of personal preparedness let alone what Emergency Management is all about. Major emergencies and disaster events are on the increase in our society due to a number of factors. Likewise, public safety communicators, who are vital links in the community's lifeline in times of crisis, may wonder how well they will respond in times of disaster, when the general public relies on them for timely assistance, correct information, and for guidance and strength. The ability to deal with disasters effectively is becoming more relevant because of factors that tend to increase risk. Unfortunately, there are recurring difficulties with disaster response. Lessons learned in previous disasters are not always applied in other communities. Sometimes this is because accurate information regarding the basic underlying causes of the difficulties is not readily available.

Emergency Planning Fundamentals

This text addresses what occurs beyond the perimeters of the communication Centre in preparation for and during times of disaster. When an incident requires the response of emergency personnel, a management system called *emergency management* is utilized. Emergency

management means managing a coordinated response to an emergency, major emergency or disaster with well-thought-out actions, defined roles and responsibilities, efficient management of resources and effective communication and communications.

Emergency planning is a critical element of emergency management and is the preparation process for managing an incident or event *prior* to its occurrence. It addresses questions of who is in charge, who does what, and what actions are to be taken to provide a coordinated response, working relationships of emergency personnel, communication, and resources.

The goal of emergency planning is to provide a fundamental framework of standardized terminology and a shared vision of performance in preparation for a standardized approach to a coordinated response. This will assist the public safety communicator to make informed critical decisions during a major emergency or disaster situation. Disaster response is emergent since no one can predict the outcome.

This planning, preparedness and response are always multi-organizational in nature due to the widespread nature of the problems encountered. Evaluations of response effectiveness must be directed at the network of emergency response entities rather than at any particular agency or individual.

Effective Communication and Emergency Planning

Communication is a lifeline for both the public and emergency responders. Without effective communication, emergency response is guaranteed to fail. It is therefore important to practise emergency plans and response procedures regularly. Emergency plans are *living* documents that must be updated and exercised on a regularly scheduled basis. Learning from these exercises and incorporating any learning from these exercises makes an emergency plan a living document.

Chapter 1: Emergencies, Major Emergencies and Disasters

The term *emergency* is used in a variety of ways. Most calls placed to a 9-1-1 line are considered by the public to be emergencies. The term *emergency planning* is usually used in reference to what is defined here as *major emergencies* or *disasters*, though usage might be different in some situations. The following definitions and probable response levels are offered as reference points for the course discussions.

Emergency

An *emergency* is a critical situation that requires immediate action but that can be dealt with by the implementation of routine departmental policies and procedures. It will usually only involve one or two agencies such as the local police and ambulance service. Example: a drug overdose emergency situation.

Major Emergency

A *major emergency* is a critical situation that requires a substantial commitment of all the resources of the area not just the resources of emergency services, for example public works, private sector heavy equipment, etc. It will likely involve the call-out of mutual aid, and some or all of the local emergency operations control groups. Example: a flood.

Disaster

A *disaster* is a critical situation that has or will exceed the emergency response capabilities and resources of the local area. A total call-out of the emergency operations control group activating the EOC should occur, and consideration should be given to a declaration of a state of local emergency, to gain extraordinary powers to mitigate the effects of the event, for example; forced evacuations, powers to enter private property without a warrant, etc.

These general definitions also apply to the communications component of disaster response. We commonly think of physical events as *disasters*.

Disaster Characteristics

- Abnormal situation

- Potential property/infrastructure damage
- Loss and/or threat to life
- Quick response requiring exceptional procedures
- Damage to or potential damage to the environment
- Socio-economic impact
- Mental and/or physical health problems

Emergency/Disaster Classifications

- Slow or rapid onset
- Gradual / Progressive
- Sudden, instantaneous
- Predictable or unpredictable
- Unexpected
- Or any combination

Natural Emergencies and Disasters

Emergencies

- Heavy snow falls
- Blizzards/Whiteouts
- Heavy Winds
- Heavy rains
- Sink-holes
- Wild Land Fires

Major Emergencies

- Severe winter storm – Victoria and Lower Mainland of B.C., 1996, Nova Scotia, February 2004.
- Extreme Wind Events – Kelowna August 1999
- Hurricane Juan – Halifax, N.S., September 29, 2003.
- Landslide – Hope landslide, 1965, McAuley Creek (Lumby) 2002

- Volcanic eruption – Mount St. Helens, March 20, 1980

Disasters

- Wild Land Urban Interface Fire – Central Interior of BC – Summer 1998, 2003 and 2009
- Ice Storm – Ontario, Quebec, Maritimes, January 1998
- Flood – Winnipeg, May 1997.
- Spring Freshet Flood – Central Interior of British Columbia – June 1997
- Flood, mudslides – Saguenay, 1996, Creston British Columbia February 1997, Oxford, N.S. March 2003.
- Tornado – Edmonton, July 31, 1987, Barrie, Ontario, May 31, 1985, Regina 1912.
- Earthquake – Prince William Sound, Alaska, magnitude 8.3-8.6, March 22, 1964.
- Tsunami – Port Alberni, 1964 – 7 metre wave, Port Alberni Inlet.
- Hurricane – Typhoon Frieda, Vancouver, October 12-13, 1962. Hurricane Juan, Halifax, N.S. September 29, 2003, Hurricane Katrina, New Orleans, LA September 2005.
- Epidemic – Polio 1953, killing 500 and effecting 8,000 persons.
- Flood – Fraser Valley – Spring 1948
- Tsunami – Burin Peninsula, Newfoundland, 1929 – 5 metre waves. December 26, 2004 – 9.15 earthquake in the Indian Ocean cause a tsunami that killed over 230,000 people in Indonesia.
- Spanish Pandemic Canada – 1918 – 30,000 to 50,000 lives lost.
- Agricultural Calamities – Mad Cow disease – England – Summer 2000 - Western Canada spring 2003.

People Caused Emergencies and Disasters

Emergencies

- Assault
- Motor Vehicle Incident
- Structural Fires
- Hostage Incidents
- Drug Overdoses, accidental or for the purpose of committing suicide

Major Emergencies

- Mine Incident
- Ship fire
- Structural failure
- Train Incident – Derailment, Haz Mat incident Rail Crossing Incident
- Civil Unrest
- Aircraft Incident

Disasters

- Terrorism – New York City World Trade Centre – September 2001
- Spring Freshet flooding
- Industrial/Transportation – Haz Mat Incident
- Nuclear Plant Incident – Ship Board or Fixed Facility
- Terrorism Activity – both Domestic or International
- War
- Fires:
 - Wild Land and Urban Interface
 - Structural Conflagration

Chapter 2: Apathy to Emergency

In order to understand why some areas of federal, provincial and municipal government and indeed the public at large appear to lag in emergency preparedness, one must understand apathy as it relates to emergency preparedness.

Public Apathy

Apart from low frequency and probability, the lack of emergency preparedness for disasters has several contributing factors. Competing priorities, government apathy, underestimation of risk, fatalism and or denial, and lack of public awareness are among the many factors. Because disasters are of low-probability, the nature of disaster and its affect has a minimal competitive edge when lives are often filled with fast-paced careers, family and daily life. Therefore, the demand for public awareness is relative to the perceived need. Public awareness of potential disaster hazards may be incomplete, and individuals may not even know what they need to ask for from various levels of government for protection.

Recently, Public Safety Communications students on an emergency planning course assignment conducted an emergency preparedness survey among the college students and the general public at a local mall. They were surprised to find that the vast majority of survey candidates knew little or nothing of emergency preparedness and had not personally prepared themselves for any type of emergency although they resided in an active earthquake zone.

The underestimation of risk as well as fatalism and/or denial can also play a large role in public apathy. With little or no immediate disaster history as a reference, public risk perception as reflected by the student survey denotes little concern for a risk that is imminent. The public's attitude toward disasters is often a mixture of "What will happen, will happen" and "It can't happen here".

Government Apathy

Historically disaster events have been responsible for the level of preparedness at the different government levels. Competing for tax dollars for something that is considered to be non-tangible through the

preparedness process puts emergency preparedness somewhat low on the government's budget priority lists; until a major event occurs that is. In a time when priorities like balancing of budgets and tackling current social problems are predominant, coupled with high public apathy, governmental emergency preparedness initiatives are reflected in a lack of political support. Contributing to governmental apathy is the fact that disasters, in spite of their increasing threat, are still improbable events. In Canada, fatalities have been very low in disaster situations. The worst one was on June 30, 1912. Regina, Saskatchewan, suffered an F-4 (332-418 km/h) tornado in which 28 persons died and 200 hundred were injured. The tornado destroyed a five block wide area in which approximately 500 buildings were destroyed and 2,500 people were left homeless. The next highest fatality disaster recently was a tornado that struck Edmonton, Alberta, July 31, 1987, killing 27 persons, leaving 300 with injuries and \$300 million in damages. Equaling it was a five-metre tsunami that hit Burin Peninsula, Newfoundland, in 1929, when an earthquake occurred on the bottom of the Atlantic Ocean. 27 people drowned, and houses, boats, and docks were destroyed. Even in the United States, only six disasters have resulted in more than 1,000 fatalities, and only about 10 or 15 disasters per year have resulted in more than 40 injuries.

Government apathy varies from province to province, municipality-to-municipality, and federal government to provincial government. In recent years two major events has increased the profile of emergency management: the lead up to Y2K and, the terrorist attacks on the World Trade Centre in New York City, September 11, 2001.

A classic example of changing priorities in British Columbia was the Silver Creek Fire that started south west of Salmon Arm on July 31, 1998. Before this fire was contained, it had damaged or destroyed 60 properties in the Silver Creek area. This fire resulted in the single largest peacetime evacuation in the history of British Columbia (7,500 people), and resulted in a complete reworking of emergency management planning in the Columbia Shuswap Regional District. Prior to the Silver Creek Fire the emergency plan for the Columbia Shuswap Regional District was outdated and antiquated. In the initial activation of the Emergency Operations Centre (EOC), and the Emergency Plan, there was poor communications,

ambiguity of authority, failure to control volunteer convergence and just plain confusion for three days of the fire event. This fire was also a key factor in the development of the British Columbia Emergency Response Management System. Prior to the Silver Creek Fire the provincial emergency management system being used was cumbersome, bureaucratic, and difficult to use.

Although the southwestern corner of British Columbia experiences 200 plus earthquakes a year, this area has yet to experience a significant level of damage. More recently a 6.8 earthquake, centred near Olympia, Washington, caused significant damage in the northwest U.S. and was felt in the Lower Mainland of British Columbia.

British Columbia has not yet experienced a major earthquake in a heavily populated area, such as those that have caused significant damage in other parts of the world. As a result, while there is clearly some political will to achieve an adequate level of preparedness, the threat of an earthquake is generally not seen to be sufficiently real or imminent to make preparedness a political priority. (British Columbia. Office of the Auditor General, 1997/1998)

The benefit of emergency preparedness efforts in today's volatile economic times is usually a process of risk management versus consequences. With the economic constraints facing most governments, spending on emergency preparedness can be very conservative. It is necessary for Emergency Managers and Planners to clearly demonstrate that the long-term monetary benefit of effective hazard management and mitigation outweighs the upfront dollars spent.

Industry Apathy

Industry apathy in Canada and the United States, especially large-scale operations, is less of a problem than other levels of apathy. Most industry is highly regulated for Emergency Management and many companies are very cognizant of their legal liability.

Mitigating Apathy

Although minimizing apathy is a difficult task, it is possible to promote emergency preparedness through awareness of recent disasters, liability awareness, whether voluntary or regulated, and public, as well as professional education.

Recent Disasters

Interest in emergency preparedness is heightened by the immediacy and impact of the most recent disaster. Prior to the 1989 Loma Prieta earthquake during the World Series baseball game in San Francisco, the province of British Columbia was unprepared to respond to consequences of a major earthquake. The San Francisco Bay area is very similar geographically and topographically to the Lower Mainland. Consequently, when this disaster occurred, the impact on British Columbians was very noticeable. The California example served as a notification to British Columbians that living in an active earthquake zone can have devastating effects. Since then, the provincial and municipal governments as well as industry "... have made significant progress over the years in some areas such as planning for response to an earthquake, and the fact that the Attorney General called for this audit suggests that the government is indeed interested in improving the state of preparedness." (British Columbia. Office of the Auditor General, 1997/1998)

The paramount factor in demonstrating vulnerability is the occurrence of a disaster. However, like in similar situations, the generated interest also erodes quickly resulting in little change in preparedness.

Liability During Emergencies

Whether it is volunteer or regulated, the responsibility and accountability incumbent upon governments to its citizens is tied to liability, albeit through re-election or court decisions. A tool used to measure municipal liability in a court of law is *Due Diligence and Standard of Delivery of Service*. In British Columbia, there is legislation that provides "exemption from civil liability" (Emergency Program Act, 1996 Section 18), yet civil action can still be initiated, and it will be up to the municipality to prove that they provided due diligence to the same level as similar type municipalities. Municipal workers who respond to an emergency are

protected from personal liability provided they acted in good faith and within the confines of the law. But a community itself can be held liable if it has failed to ensure the safety and security of its citizens without good faith.

The *Emergency Plans Act, 1983*, Statutes of Ontario, 1983, Chapter 30 and the British Columbia *Emergency Program Act 1996*, and *Emergency Management Act, Nova Scotia*, are provincial examples of governmental responsibility for citizens. Each Act requires the provincial and municipal governments "... maintain an emergency management organization to develop and implement emergency plans and other preparedness, response and recovery measures for emergencies and disasters" (British Columbia

Attorney General – Emergency Program Act, 1996).

Awareness through Education

Public Education

Mass emergency preparedness information programs, such as the International Emergency Preparedness Week (recognized throughout North America) held the first full week in May each year, assist all levels of government, often with the important help of the media, to inform the public and encourage industry to become proactive in their own level of preparedness. During that week, information sessions on personal preparedness are presented for the public, while industry is challenged to hold emergency exercises. To counteract apathy, public awareness programs are increased after a disaster when the public is motivated to learn how they can become more self-sufficient, how they can help their neighbourhoods and communities, and learn about their community's emergency planning.

Professional Development

Emergency Management training and regularly scheduled exercises are the best tools to fight complacency. While the greatest lessons learned are those that are learned through actual experiences, this can also be the worst time to be learning emergency management lessons, especially when those lessons can be at the peril of disaster victims! So, the next best tool for learning 'real time' lessons is *exercises*. Emergency exercises give

professionals the opportunity to test plans, receive feedback and re-work procedures.

Chapter 3: North American Hazards

Public safety communicators will be faced with any number of emergencies, both large and small, in the course of their careers. Canadian communities may experience social emergencies and road accidents on a daily basis, and less frequently, hazards such as chemical spills, train derailments and plane crashes. People complying with traditional rules and regulations, by being properly trained, and by operating safely, can prevent many of these. However, natural disasters such as earthquakes, floods, wildfires and other Acts of God cannot be prevented. They can, however, be mitigated. The following section illustrates the hazards to which Canadians may, and in some cases, have been exposed to.

Natural Hazards – Atmospheric

Major Storms

The term major storms can include both *snowstorms* and *thunderstorms*. *Snowstorms* can cause problems with blocked roads and highways, or downed hydro and communications lines. Urban areas unaccustomed to heavy snowfall may be paralyzed. This was experienced in the Lower Mainland and southern Island of British Columbia during the winter of 1996. Even in regions where winter storms are common, major storms such as the ice storm in Eastern Ontario, Quebec and the Maritimes (January 1998), can overwhelm existing resources.

Lightning strikes that occur during *thunderstorms* cause forest fires during dry periods. They can also cause damage to buildings, electrical transmission lines and communication systems. Major floods in B.C. have been the result of excessive rainfall on snow in November and December (Lower mainland and Sunshine Coast November 1995) and spring time snow melt, (Spring Freshet), of the watersheds (Fraser River watershed spring 1999). The flood plains and alluvial fans around rivers creeks and streams are particularly at risk.

Snow Storms and Blizzards

Snowstorms are a large accumulation of snow within a relatively short period of time. Snow removal is difficult due to the large amount.

Blizzards, on the other hand are generally accompanied by high winds (typically in the 90 to 130 kilometers per hour range), blowing snow and low temperatures. There is a wind chill factor associated with the high winds that further intensifies conditions. Blizzard conditions are most intense in areas where there are no forests to break the effects of the winds.

A major blizzard on December 28 and 29, 1996 paralyzed most of the southern third of British Columbia. It was the largest snowfall since 1916 and broke a 75-year snowfall record. The Trans-Canada, the Coquihalla and Hope Princeton Highways, east of Abbotsford in the Fraser Valley were closed, stranding motorists and isolating many communities. Police, volunteers and the military located and rescued 250 stranded motorists in the Sumas Prairie region and close to 700 stranded motorists in the interior of the province who were trying to travel to the Lower Mainland.

They were housed in schools and farmhouses for a number of days. As well as closing roads, the heavy snowfall isolated communities throughout the Fraser Valley from Hope to Ashcroft with seven massive avalanches along the Trans Canada Highway. Weather effects from freezing rain followed by more rain provided additional problems such as washed-out roads and blockages from landslides, further compromising transportation in the Upper Fraser Valley and the Victoria area.

Ice Storms and Ice Fogs

An *ice storm* combines high wind, freezing temperature and freezing rain or drizzle (Chaine et al. 1974), and can paralyze unsuspecting and unprepared areas for many days. An *ice fog* combines very cold temperatures and a source of warm moisture. The 1998 Great Ice Storm, which impacted Ontario, Québec and some Maritime provinces, was affected by the high levels of particulate pollution and moisture emitted to the atmosphere by the wood burning stoves in many urban and rural places in the province. These particles provided the foundation on which water vapor condensed, exacerbating the condition. Loss of power caused the largest, far-reaching impact.

“What makes this incredible is the extent to which people are affected,” said John Scanlon of the Emergency Communications Research Unit at Carleton University ... The ice storm’s impact robbed few properties and human

lives, but the level and duration of disruption it caused make it one of the most significant catastrophes in North American history (Kathleen Harris – Ottawa Sun, January 18, 1998).

Hailstorms

Hail is precipitation in the form of balls or irregular lumps of ice with a diameter of five millimeters or more, while smaller particles may be classified as either ice pellets or snow pellets. Hailstones are created by the gradual accretion of layers of frozen cloud droplets around an initial ice crystal or frozen water droplet, and can on occasion grow larger than 10 centimeters (about the diameter of a grapefruit), and can strike the ground at speeds of up to 130 kilometres per hour, damaging cars and crops. Hailstorms happen more frequently in the West and in southwestern Ontario, but can occur across Canada, generally only from May to October. These sometimes violent storms can appear suddenly and can cause a great deal of damage. The area around Calgary and Medicine Hat in Alberta are particularly susceptible, and expect up to 10 hailstorms a year.

The worst hailstorm in Canadian history lasted only thirty minutes and became one of the largest insurance pay out with tens of thousands of,000 claims totaling over \$400 million. It occurred in Calgary, Alberta, on July 12, 2010.

Lightning

Lightning is caused when three factors are present: moisture laden air, the instability of existing weather systems, and a triggering agent, which causes air near the ground to ascend. This triggering agent may be a mountain range where surface heating causes upward thermal currents, or frontal lift system. Thunderclouds or thunderstorms, often in the form of spatially dispersed – yet still dense – cloud complexes, are the source of lightning. There is a high electrical charge in the atmosphere during a thunderstorm and the danger of injury, death or fires caused by lightning strikes is very severe. Lightning strikes are a major cause of forest fires in the dry summer season.

Hurricanes and Tornadoes

Hurricanes, or *tropical cyclones* or *typhoons* as they are known in some parts of the world, are officially defined as storms with winds greater than 110 kilometers per hour. Hurricanes are extensive storms, often over 600 kilometers in diameter (United Nations, 1991). A tornado is a very-rapidly-rotating air funnel hanging from a cumulonimbus cloud and is observed as *a funnel-shaped* cloud accompanied by black skies, strong winds, lightning, thunder and heavy rain or hail. Sometimes the sky will turn an unusual colour, such as green, and the wind will sound like the roaring like a freight train. Both hurricanes and tornadoes are associated with destruction of property and loss of life (Natural Resources Canada, 1996).

Hurricane Juan struck Nova Scotia on September 29, 2003, prompting the largest emergency response effort in Nova Scotia since the Halifax explosion of 1917. Hurricane Igor struck the province of Newfoundland on September 21, 2010. The wind and rain battered the island hard enough to leave 150 communities cut off after roads and bridges were washed out or destroyed. More than 150 mm of rain fell in some communities. In St. Lawrence, on the Burin Peninsula, the rainfall measured almost 240 mm in just 20 hours.

Tornadoes are difficult to predict because of their nature and speed. These phenomena are associated mostly with warm weather and occur most frequently in the mid-afternoon to early evening, particularly in June and July. Tornado season extends from April to September; however, tornadoes in Canada have been known to occur in any month, as do hailstorms. In Canada, tornado warnings are issued by Environment Canada via the media. Areas of high risk in Canada include Alberta, southern Ontario, southwestern Quebec and the southern portion of Saskatchewan and Manitoba to northwestern Ontario. Tornadoes have also been reported in the BC interior and western New Brunswick.

On June 30, 1912, Regina, Saskatchewan, suffered an F-4 (332-418 km/h) tornado with a death toll of 28 persons and 200 hundred were injured. The tornado destroyed a five block wide area in which approximately 500 buildings were destroyed, and 2,500 people were left homeless. Another tornado struck Edmonton Alberta, July 31, 1987, killing 27 people and

injuring 300, and leaving \$300 million in damages. The largest recorded tornado to ever hit Canada was in Elie, Manitoba on June 22, 2007 and was classified as an F5, the strongest and most powerful rating for a tornado.

Heat Waves

A *heat wave* can take a number of forms. Heat waves are characterized by temperatures significantly above the mean for an extended period, or by a combination of high temperatures with high humidity and a lack of air motion.

Natural Hazards – Geological

Avalanches

An *avalanche* is a mass movement of snow and ice down an incline in response to the force of gravity. February and March are the most avalanche prone months, with others reported in January and during spring thaw in April. Canada's worst avalanche event killed 62 workmen at Rogers Pass, British Columbia, while they were digging out the tracks of the CPR from an earlier avalanche in March 1910. The increased popularity of backcountry skiing and snowmobiling brings people into high-risk areas. The winter of 2003 saw 28 people die in back country avalanches in western Canada. The two largest avalanches occurred in the BC's Selkirk Mountains where first a party of seven people were killed, and in a second avalanche within a week time frame, another seven Calgary, Alberta high school students lost their lives. A defensive tool against avalanches on highways is called avalanche *bombing*, in order to activate controlled avalanches to reduce the incidence and severity of natural avalanches. There are a large number of sites set up along the Coquihalla Highway and the Rogers Pass on British Columbia's portion of the Trans-Canada Highway. Preventative avalanche bombing practices are also used at various Canadian ski resorts.

Debris Flows and Avalanches

Debris flows involve loose soils; rock and organic matter, combined with air and water, forming slurry that flows rapidly down a slope (United Nations, 1991). Debris avalanches are terrifying avalanches of mud, rock, brush, trees and other debris loosened and propelled by torrential rains.

There are very rapid to extremely rapid debris flows. Several debris flows have occurred on the Sea-to-Sky Highway from Vancouver to Whistler, British Columbia, resulting in loss of life and destruction of highways.

Landslides

Landslides and *rockslides* are the result of downward and outward movements of slope materials reacting to the force of gravity. They cover a wide variety of landforms and processes but do not travel far. Slide material may be composed of natural rocks, soils, artificial landfills, or combinations of these components. Landslides can be classified according to two criteria: types of movement, and types of material (United Nations 1991). Types of material are bedrock and soils, including debris and earth. Canada's worst landslide disaster occurred at Frank, Alberta, in 1903 when 90 million tonnes of limestone detached from Turtle Mountain and buried part of the coal mining town of Frank resulting in the deaths of about 75 people. The Hope slide, which occurred on January 9, 1965 spread 47 cubic meters of debris over a three-kilometer section of the Hope-Princeton Highway, and is one of the largest recorded in Canadian history.

Land Subsidence

Land subsidence occurs when the ground has been undermined, usually by the removal of ground water. The rock and sediment usually compact and can cause depressions and sinkholes in the earth.

Slumps and slides are especially common in the sensitive glaciomarine Pleistocene sediments of the St. Lawrence Lowlands of eastern Canada. The sediments are commonly called Leda Clay. A family of four were killed in Quebec when their home was seemingly swallowed by the earth in May 2010.

Natural Hazards – Hydrologic

Drought

Drought results from an abnormal water deficiency. While drought is often measured in terms of water deficiency, it manifests itself in crop failures, dust storms, deficient and polluted water supplies, and distressed economic and ecological systems (McKay, 1988).

Erosion and Accretion

Erosion is the detachment of soil, sediment and rocks by natural forces of water and wind. Erosion is increased in areas where land use has disturbed the soil. Coastal erosion is marked by the carrying away of beach material

by wave action, tidal currents, or by deflation. Similarly, riverbank erosion is the result of river currents removing riverbank material. Accretion is defined as the build-up of land by natural or artificial means. The creation of a delta at the mouth of a river is an example of accretion.

Floods

Floods occur when normally dry land is covered with water. Floods are the number one natural disaster in Canada in terms of property damage. They can occur in any region, in the countryside or in cities, at virtually any time of the year. They have affected thousands of Canadians. Most flooding occurs when the flow of water in a river or stream exceeds its channel. Floods also occur along the shoreline of lakes and oceans when water rises after high runoff, storm surge or the hammering of waves.

A historic flood occurred in 1996 in the area of Saguenay-Lac-Saint-Jean, Québec. The flood, which was an effect of rivers swollen and six hydroelectric dam breaches on the Saguenay River system caused by a three day torrential downpour of rain. The event destroyed 488 homes and damaged another 1,230. 16,000 people were evacuated and taken to safety. Similarly, the great 1997 Red River Flood in Winnipeg, Manitoba, flooded an area of 1,950 square miles, with 28,000 people evacuated at the height of the disaster. Transportation infrastructure including bridges and roads sustained extensive damage caused by heavy rain and flooding in Nova Scotia during March 2003. Catastrophic flooding in Alberta occurred around June 20, 2013 when the areas around the Bow, Elbow, Highwood, Red Deer, Sheep, Little Bow, and South Saskatchewan rivers and their tributaries spilled their banks after heavy rainfall in the area. A total of 32 states of local emergency were declared.

Local Flooding

Flooding need not be associated with an extreme hydrologic event, but may be caused by poor or blocked drainage. Such local flooding is often an annual event occurring on agricultural land and in other places, and can cause hardship (Hay 1992).

Rain Storms

The basic cause of most river floods is excessive rainfall, which causes significant elevations in river levels (United Nations 1991). The effect of elevated water levels is the inundation of low-lying river flood plain area.

Horrific rainstorms are a part of Maritime history. A record 1973 frontal storm damaged Fredericton, New Brunswick, and surrounding farmland with the largest flood ever. Damages to the province were \$19 million.

Snow Melt River Flooding

River floods can also be caused by snow melts which cause significant elevations in river levels and flooding in low-lying areas (Hay 1992).

The Exploits and Gander River Basins in 1983 had a severe flood caused by a rainstorm, snowmelt and a rapid ice break-up ended with partial ruin of the Bishop's Falls' dam and powerhouse. Gross damages were estimated at \$42 million. The Badger disaster of February 2003 was another example of ice jams on the Exploits, Badger and Red Indians Rivers causing flooding in the Newfoundland town.

Storm Surges

Storm surges are described as temporary increases or decreases in water levels than normally associated with astronomical tides. They accompany storms and are caused by winds driving waters shoreward, often coupled with low-pressure systems. Storm surges most often occur when a strong wind blows over a long body of water, perhaps several hundred miles, in a generally constant direction, and where it meets shallow offshore water. Rugged coastlines with deep offshore waters do not suffer from storm surge effects.

Natural Hazards – Seismic

Earthquake

Earthquakes are perhaps the most dangerous of all natural hazards. They have resulted in the loss of more than a million lives worldwide during the 20th century. Though they are not widely recognized as a major hazard in Canada, more than 50 earthquakes strong enough to be felt by ordinary people occur each year.

Seismologists use a magnitude scale to express the seismic energy released by each earthquake. Although each earthquake has a unique magnitude, its effects will vary greatly according to distance, ground conditions, construction standards, and other factors.

<i>Richter Magnitude</i>	<i>Earthquake Effects</i>
Less than 3.5	Generally not felt, but recorded
3.5 – 5.4	Often felt, but causes only minor damage
5.5 – 6.0	Causes slight damage to buildings
6.1 – 6.9	Can be destructive in areas where people live
7.0 – 7.9	Major earthquake causing serious damage
8.0 or greater	Great earthquake causing total destruction to nearby communities

Movement at the major seismic fault system off the coast of British Columbia (Cascadia Subduction Zone) has resulted in numerous quakes of significant size in past 200 years (Magnitude 6-7). Each year, 200+ smaller quakes occur in the Lower Mainland of B.C.

In June 1946, a 7.3 earthquake struck central Vancouver Island. It was widely felt. There was extensive damage along the east coast of Vancouver Island; one person drowned.

A 6.9 earthquake that struck the Nahanni region in the Northwest Territories in 1985 could be felt in other areas in the territories and in Alberta and British Columbia. Prior activity recorded as a smaller earthquake of M6.0 caused a large avalanche of rock to occur. In the active Canadian eastern zone, a major earthquake of M6.0 at the Saguenay region of Québec caused damage in Jonquièrre, Chicoutimi, La Baie, Québec and Montréal. The amplitude could be felt 1,000 kilometres from the epicentre.

A 6.8 magnitude earthquake with an epicentre near Olympia, Washington, occurred on February 28, 2001. It was widely felt in the Lower Mainland of British Columbia and Vancouver Island, and there was extensive damage in Olympia, the Washington state capitol, the nearby city of Seattle, and the International SeaTac Airport.

The Modified Mercalli (MM) Intensity Scale was developed in 1931, and is a seismic scale used for measuring the intensity of an earthquake. This scale is designed to describe the effects of an earthquake, at a given place, on natural features, on industrial installations and on human beings. The intensity differs from the magnitude which is related to the energy released by an earthquake. The Modified Mercalli (MM) Intensity Scale was developed in 1931, and is a seismic scale used for measuring the intensity of an earthquake. This scale is designed to describe the effects of an earthquake, at a given place, on natural features, on industrial installations and on human beings. The intensity differs from the magnitude which is related to the energy released by an earthquake. The scale is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, and is designated by Roman numerals.

- I. Not felt, or felt by only a few people in special circumstances.
- II. Felt only by a few people at rest, especially on upper floors of buildings.
- III. Felt quite noticeably by people indoors, especially on upper floors of buildings. Most do not realize it is an earthquake.
- IV. Felt indoors by many people; outdoors by few; some awaken if at night.
- V. Felt by nearly everyone; many awakened; dishes and windows break; plaster cracks.
- VI. Felt by everyone; many frightened and run outdoors; heavy furniture moves.
- VII. Everyone runs outdoors; slight to moderate damage in ordinary structures.
- VIII. Considerable damage in ordinary structures; chimneys and monuments fall.
- IX. Considerable damage in all structures; ground cracks and underground pipes break.
- X. Most structures destroyed; rails bend, landslides occur; water overflows banks.
- XI. Few structures left standing; bridges destroyed; broad fissures in ground.
- XII. Damage total; waves seen on ground surfaces; object thrown in the air.

Ground Motion

Ground Motion is violent shaking of the ground accompanying movement along a fault rupture (United Nations 1991).

Surface Faulting

Surface faulting is the offset or tearing of the Earth's surface by differential movement across a fault (United Nations 1991). The only record of surface faulting in the eastern North America came as a result of a 1989 earthquake on the Ungava Peninsula, Québec that registered a magnitude of 6.3 on the Richter scale.

Ground Failure

Ground failure is generally regarded as earthquake-induced permanent disruption of geologic materials at the ground surface, such as lateral spreads, flow failures, densification and ground settlement, sand boils and loss of bearing capacity. These types of earthquake-induced ground failures may destroy or damage buildings and transportation facilities.

Tsunami

Tsunami comes from the Japanese words 'tsu' meaning harbour, and 'nami' meaning wave. (Palmer 1989) They are terrifying sea waves produced by underwater events like earthquakes, mudslides or volcanic eruptions. They often start small in the open sea, but may pile up to heights of 30 meters or more in shallow water. The damage can be extensive.

In Burin Peninsula, Newfoundland, 1929, an earthquake occurred on the bottom of the Atlantic Ocean, which generated a five-metre high tsunami drowning 27 people and destroying houses, boats and docks on the Burin Peninsula. The seismic activity off the coast of British Columbia results in frequent tsunami warnings, watches and bulletins issued along the west coast of Vancouver Island.

The worst recorded Canadian tsunami was experienced in British Columbia in 1964 as a result of the Great Alaska earthquake. The earthquake registered 9.2 and caused a 2.4-metre wave at Tofino on Vancouver Island. Five million dollars in damage was incurred due to a six-metre wave at another Island town, Port Alberni. In total the tsunami inflicted \$10 million in damages, including damage to 320 buildings.

A 9.15 earthquake in the Indian Ocean on December 26, 2004 triggered a series of lethal tsunamis South-East Asia, a killing approximately 230,000 people. This area has still not fully recovered from the devastation caused. An earthquake struck Japan on March 11, 2011, and triggered powerful tsunami waves that reached heights of up to 40.5 metres. Floating debris from that tsunami has been spotted on the west coast shores of North America since 2012.

Natural Hazards – Volcanic

Volcanoes are uncommon in Canadian. There has been only one documented volcanic eruption in Canada in history, but there are many dormant volcanoes in western Canada, particularly in northwestern British Columbia. The entire western Cordillera (BC/Yukon) remains geologically active. Geological time ignores human clocks, so the possibility of an eruption – even a large, explosive one – cannot be ruled out. Quiet as they are, our west coast volcanoes are part of the Pacific *ring of fire*.

Canada's most significant volcanic risk comes from explosive eruptions in adjacent Washington and Alaska. Prevailing winds would blow the ash into Canada, as has happened in the past. Ash fallout would cause respiratory ailments for people and be a hazard to any technology. Mount St. Helens in Washington State erupted as recently as 1980, and since October 11, 2004 it has been in a constant eruptive state. Mount Baker in northern Washington State is an active volcano, although it has not erupted since the mid-1800's.

Ash Falls

Ash or *tephra* is finely fragmented volcanic rock or lava blasted or erupted out of a volcano vent. Volcanic ash, the smallest of tephra fragments, can travel hundreds to thousands of kilometers downwind from a volcano in a violent eruption. In less energetic eruptions, tephra may extend only a few kilometers from the vent. Volcanic ash covers just about everything and is highly abrasive. Ash in the atmosphere can block sunlight to cause temporary darkness and reduce visibility to zero. Ash is very slippery, especially when wet; causing roads, highways, and airport runways to become impassable. Air filters in automobiles, machinery and even jet

engines may become clogged with ash and moving parts can be damaged from the highly abrasive substance. Pyroclastic Flows and Surges

The word "pyroclastic" is derived from the Greek words *pyro* (fire) and *klastos* (broken). This describes the materials formed by the fragmentation of magma and rock in explosive volcanic activity. *Pyroclastic flows* are dense avalanches of hot gas, fine hot ash, and rock particles that cascade down the slopes of the volcano. Pyroclastic flows travel great distances and at high speed and are extremely destructive, burning everything in their path. Speeds of between 50 and 150 km/hr have been measured, and distances of 30 kilometers are not unusual. *Pyroclastic surges* are generated by volcanic explosions, usually in the early phases of an eruption. They are more turbulent and dilute than pyroclastic flows but also contain searing gas and rock debris.

Lava Flows

Lava flows are streams of molten rock from an erupting volcano. People most often associate *lava* (molten rock) flows with volcanic eruptions. However, not all eruptions produce lava flows. Lava is erupted during either non-explosive activity or explosive lava fountains. Lava flows destroy everything in their path, but for the most part, are slow moving.

Mudflows or Lahars

Lahar is an Indonesian term that describes a hot or cold mixture of water and rock fragments flowing down the slopes of a volcano and (or) river valleys. When moving, a lahar looks like a mass of wet concrete that carries rock debris ranging in size from clay to boulders more than 10 m in diameter.

Mudflows, or the Indonesian term *lahars*, are slurries of water and rock particles descending from a volcano. The rock particles can be very fine, creating flows of milkshake-like consistency that behaves like wet concrete. The flows can also be more dilute, carrying an enormous range of rock particles, from fine flour-sized grains to house-sized blocks. Lahars can vary in size and speed. As a lahar travels downward, its size, speed, and the amount of water and rock debris it carries constantly change. The surge of water and rock debris often erodes rocks and vegetation from the side of a volcano. This can also incorporate water from melting snow and

ice on the mountain. By eroding rock debris and incorporating additional water, lahars can easily grow to more than 10 times their initial size. As a lahar moves farther away from a volcano, reduces its heavy load of sediment and decreases in size.

Landslides or Sector Collapse

Volcanoes are susceptible to landslides, due to the weakening of the volcanic rocks to a muddy, clay material following explosive eruptions. The collapse of a volcano, and the resulting lahar, can be expected even long after the volcano stops erupting.

Natural Hazards – Wildfire

A *wildfire* exists when there is uncontrolled burning in grasslands, brush or woodlands. The average number of wildfires that occur every year in British Columbia is normally 2,000, with half caused by people and half caused by lightning. Wildfires may impact adjacent property and infrastructure, or threaten human lives these types of fires are known as wild land urban interface fires. Due to urban sprawl and more people wanting to live closer to forested terrain, British Columbia in particular has had a number of wild land urban interface fire events over the past fifty years, Invermere Valley 1986, Garnet Fire (Penticton) 1994, Greenstone Mountain Fire (Kamloops) 1998, Silver Creek Fire (Salmon Arm 1998), Tulameen Fire 1998, the most devastating fires in 2003 for Chilcotin, Barriere and Kamloops in 2003, and most recently in Peachland in September 2012..

Disease, Epidemics and Pandemics

A disease is a disordered or abnormal condition of an organism possibly resulting from a variety of factors. An epidemic is a disease affecting many individuals at the same time and is usually characterized by a rapid spread or increase in the occurrence of the disease. A pandemic is defined in the Oxford Dictionary as “prevalent over a whole country or the world” as in the 1918 Spanish Influenza Epidemic where estimates of Canadians who died range from 30,000 to 50,000 people (Disaster Canada, Janet Looker, 2000 by Lynx Images Inc.). The human diseases discussed in this section are diseases and epidemics that affect people, cause death, have serious economic implications and form the basis for a mass casualty emergency

response. Animal diseases or sicknesses can be spread from animals to animals and from animals to humans. They are classified by a number of criteria into several groupings: non-infectious diseases, infectious diseases, and diseases caused by parasites. Plant diseases are generally defined as any series of harmful physiological processes caused by irritation of the plant by some invading agent (Stall and Roberts 1978). These invading agents are typically referred to as plant pathogens and include viruses, bacteria, fungi, and algae.

The 2009 flu pandemic in Canada was described as part of an epidemic of a new strain of influenza A virus subtype H1N1 causing what has been commonly called swine flu.

Person-Induced Hazards – Accidents

Hazardous Materials

Hazardous materials travel extensively across Canada via transport trucks, rail and air. Major cities in the country provide terminus points for transport and densely populated areas are increasingly at risk to exposure to hazardous materials spills. In British Columbia, the Lower Mainland is the west coast terminus for the majority of rail traffic in Canada and includes the products of the petrochemical industry; Prince Rupert receives the rest. Vancouver is a major port for the west coast of North America.

Aviation Incident

An air crash is considered to be an accident involving one or more airplanes. While most airplane crashes occur on or near an airport, airplane crashes can occur anywhere.

Canada's major airports provide major transportation hubs for the country and the world. During peak travel time, aircraft arrive and depart on congested runways at two-minute intervals. For example, the Vancouver International Airport (YVR) is a major international airport within a heavily populated community. The local rugged geography and the active volcanic threat combined with fluctuating and often-dangerous meteorological conditions create great potential for disaster to occur.

With four local airports within the YVR operating area and the flight path for YVR calling for flight over Fraser Valley communities during strong

prevailing wind conditions, there are alerts for “aircraft in trouble” at YVR on a regular basis.

Marine Accidents

Marine accidents are shipping events that threaten human life, property, the environment, and/or natural resources. Ship collisions, ship fires, and hazardous material spills threatening human life, natural resources and property are typical of marine accidents. The raising of the *Kursk*, a Russian nuclear submarine, was a delicate operation. This nuclear submarine, which sank following an explosion in August 2000, lay in 108 meters of water at the bottom of the Barents Sea with the bodies of more than 100 men and a substantial part of its weaponry still onboard.

Off shore oilrigs are considered to be marine vessels with ship captains at their helms. On February 15, 1982 the Ocean Ranger demonstrated how off shore oilrigs are just as vulnerable at sea as any ship. The Ocean Ranger went down in heavy seas in the Hibernia Oil Field off the coast of Newfoundland with all 84 crewmembers aboard. After days of extensive searching only 22 bodies were ever recovered, (*Disaster Canada, Janet Looker, 2000 by Lynx Images Inc.*).

Risk indicators for marine navigation include winds, visibility, currents, water depths, passage widths, course changes and shipping depth. (*British Columbia Hazard, Risk and Vulnerability Analysis – June 1993*).

On February 5, 1992, a British Columbia ferry collided with a private catamaran in fog at the mouth of Active Pass, and on March 12, 1992, a British Columbia ferry collided with a large coal-carrying freighter. Hartley Bay, B.C. was the site of the sinking of B.C. Ferries “*Queen of the North*” on March 22, 2006, where two persons were lost. Such accidents can and do happen.

Motor Vehicle Crashes

Motor vehicle crashes occur whenever a motor vehicle – a truck, passenger car, bus, farm vehicle or any other motor-powered vehicle – collides with another motor vehicle, train or other obstruction and incurs damage and/or loss of life.

Rail Accidents

Rail accidents occur when a train derailed or collides with another train, motor vehicle or obstruction on the rail tracks.

When a train carrying hazardous substances derailed in Mississauga, Ontario, in November 1979, over 250,000 persons had to be evacuated from their homes over a five-day period. This accident brought to light the need for emergency preparedness in Canada.

In August 2005, a carload of caustic soda dumped from a derailed CN train into the Cheakamus River near Squamish, B.C., killing thousands of fish.

The Québec town of Lac-Mégantic, was the site of a train derailment on July 6, 2013, when a 74-car freight train carrying crude oil derailed, resulting in a fire and explosion of a number of tank cars. The result was 47 people dead and most of the downtown area was destroyed.

Dam Failure

A *dam breach* is defined as a breach in the dam itself, its foundation, abutments, or spillway, which results in large or rapidly increasing uncontrolled releases of water from the reservoir (BC Hydro 1985).

During the 1996 flood in Saguenay, Québec, the city of Jonquière dam along Rivière aux Sables was breached. The breach, about 20 m wide, occurred within the concrete wing of the dam, thereby lowering the reservoir by several meters. Floodwaters also severely damaged the powerhouse located immediately downstream of the dam. The failure of a dam holding back an 80-year-old reservoir lake is responsible for a mudslide that destroyed five homes near Oliver, B.C. in June 2010.

Person-Induced Hazards – Explosions

Pipeline and Utility Duct Explosions

Gas leaks and explosions occur when natural gas or gasoline pipelines rupture, by accident or because of poor design or corrosion. Gas leaks can also be caused by natural hazards such as earthquakes or landslides.

Soil Generated Gas Explosions

Decomposition of organic material such as man-made garbage or natural peat deposits generates methane gas, often called marsh gas or soil gas.

Mine Explosions

Mine explosions are usually caused by a buildup of explosive gases underground in the mine. These gases can be set off by a spark or by miners entering, working, or leaving the area. Errors with the handling of explosives underground can also cause life-threatening explosions.

Canada's most recent large mine explosion occurred at the Westray coal mine in Pictou County, Nova Scotia, in May 1992, killing the 26 miners who were underground.

On May 17, 2006, four people died in an accident at the de-commissioned Sullivan Mine near Kimberly, B.C. A contractor doing routine water sampling, was overcome by hydrogen sulfide gas which had filled the small shed that contained the water well. Two days later, after being reported missing, he was found by a Teck Cominco employee who was able to dial 9-1-1 before also succumbing to the gas. The two paramedics who responded also died in the oxygen-deprived atmosphere of the shed. The bodies were recovered by firefighters equipped with oxygen masks

Other Explosions

There are other explosions, which occur, other than those occurring in mines or by natural gas, propane or gasoline. The largest death toll in Canadian history due to a person-induced explosion occurred in Halifax Nova Scotia December 6, 1917. A Norwegian freighter and a French munitions ship collided in the Halifax Harbour. Within 20 minutes of the collision the French ship exploded flattening everything within 800 meters and causing damages up to 1.6 kilometres away 1963 people lost their lives (Disaster Canada, Janet Looker, 2000 by Lynx Images Inc.).

Person-Induced Hazards – Fire – Urban and Rural

Urban Fires

The term urban fire is normally used to define structural fires.

Approximately 95% of structural fires are handled using the resources of the first responding agencies arriving on scene. When structural fires become difficult to contend with and require extraordinary resources, the fire moves from being an emergency to a major emergency or disaster.

Two circumstances in which this may happen are: in the case of a factory

fire there may be dangerous goods inside the structure that the responding fire resources are unable to deal with. Secondly if a fire moves from one structure to another burning out of control, the term that is used is conflagration.

An example of a conflagration occurred in Prince Rupert, British Columbia, in October 1993. An elderly man living in an apartment above a storefront in downtown Prince Rupert fell asleep with a pot on the stove. The contents of the pot caught fire and rapidly spread throughout the apartment. It quickly spread to a store and then moved to the attached buildings next door. In a matter of minutes these fires exceeded the capability of Prince Rupert and Port Edward Fire Departments. The British Columbia Forest Service was called in by the Provincial Emergency Program to assist in containing the fire. The Forest Service called in two Bell 205 helicopters with 1,500 gallon water buckets to control the fire long enough for the fire departments to extinguish it.

Person Induced Hazards – Hazardous Material Accidents

Hazardous Material Spills: – An uncontrolled release of a product, which threatens, health, safety, property and the environment is considered a hazardous material spill. An estimated 35 percent of all freight trains and one truck in 10 carry hazardous material (Ministry of the Solicitor General and Correctional Services, Ontario). The marine transportation of hazardous materials involves primarily the use of tankers and barges.

In Oakville, Manitoba, 1992, 400 people were displaced from their homes for 24 days after a dangerous goods spill. On October 16, 1996, PCBs leaked from a toxic-waste processing plant near Swan Hills, Alberta, (nearly 200 km northwest of Edmonton) after a duct broke in equipment used to vaporize chemical waste.

The Hagersville tire (December 1997) and the Plastimet PVC (Hamilton, July 1997) fires in Ontario have created heightened awareness to the impact of hazardous materials to health and the environment.

Power Outages

Power outages occur on a regular basis; however, they become of concern when the power outage is for a significant amount of time or when temperatures are very low and persons, livestock or businesses are affected.

A major secondary impact of the 1998 Ontario/Quebec Ice Storm was the power outages it caused through the two provinces and the north central United States. There were 25 deaths attributed to the ice storm. The majority of those deaths were a direct result of the power outages. People died from hypothermia and carbon monoxide poisoning. Some people brought propane barbeques into their homes for both heat and cooking and ended up succumbing to the toxic fumes produced by the barbeque.

Riots

A riot is a violent public disorder, specifically a disturbance of the public peace by a group of persons with either a common or random intent to destroy property, assault persons or otherwise disturb the peace.

There are many causes of riots, from house parties spilling in to the streets to racial tensions as witnessed by the Los Angeles riots in 1992, to sports celebrations, causing the 1994 Stanley Cup Riot in Vancouver, BC. and riots in Edmonton, AB and Toronto, ON. The primary impact from most riots is social economics where property and commercial operations are severely damaged and looted, while innocent bystanders are forced to flee their homes for personal safety.

Space Object Crash

A space object crash is as a result of either a technological or natural object from space, penetrating earth's atmosphere and crashing on earth, causing damage. This can be a meteor, comet or other naturally occurring space object, or it can be a man-made satellite, space station or spacecraft. The space shuttle Columbia's disintegration during re-entry to the earth's atmosphere in February 2003 resulted in a restriction to air traffic for an extended area between Texas and Louisiana and debris scattered across several states. A large meteorite crashed to earth in Russian on February 13, 2013. The impact wave damaged several buildings, and blew out thousands of windows during the frigid winter weather.

Structural Collapse

Structural collapse occurs when a building or structure collapses due to engineering or construction problems, metal fatigue, or as a result of changes to the load-bearing capacity of the structure.

Terrorism

Terrorism is considered to be a hostile act committed against the state, designed to exercise the systematic use of terror, especially as a means of coercion. The act of terrorism itself is meant to terrorize more than just its direct victims. The classic example of this was September 11, 2001, when the World Trade Centre was destroyed by two jet aircraft deliberately crashed into the twin towers. Even though there were approximately 3,000 people killed and countless numbers of family members and friends of the victims impacted, the fear generated the magnitude of the event shook the nation and the majority of the world. Cities across Canada became temporary homes for thousands of travelers grounded by the closing of U.S. and Canadian airspace.

War

War is considered to be a hazard of national, not provincial focus, in that the commitment to engage in armed conflict with another sovereign nation can only be made at the national level. Making a judgment as to the likelihood of war is beyond the scope of this project, other than to mention that it is always a possibility and should be considered at some provincial level. With increased media coverage, wars enter our homes and can affect our lives in a very powerful manner.

Chapter 4: Canadian Emergency Legislation

Federal Emergency Preparedness Legislation

Emergency preparedness in Canada is based on the following principles:

- It is up to the individual to know what to do in an emergency.
- If the individual is unable to cope, governments respond progressively, as their capabilities and resources are needed.
- Most local emergencies are managed by local response organizations, which are normally the first to respond.
- Every province and territory also has an Emergency Measures Organization (EMO), which manages any large-scale emergencies (prevention, preparedness, response and recovery) and provides assistance and support to municipal or community response teams as required.
- Government of Canada departments and agencies support the provincial or territorial EMOs as requested or manage emergencies affecting areas of federal jurisdiction. From policing, nuclear safety, national defense and border security to the protection of our environment and health, many federal departments and agencies also work to prevent emergencies from happening or are involved in some way in a response and recovery effort.

Emergencies are dealt with first by local officials, such as hospitals, fire departments, police and municipalities. If they need assistance, they request it from the provincial or territorial EMO, who in turn seek assistance from the Government of Canada if the emergency escalates beyond their resource capabilities.

(Government of Canada website: <http://www.epc-pcc.gc.ca>)

In Canada, citizens have a responsibility to know and understand the types of emergencies they may face and, to the extent practicable, be prepared to meet them. More than 60 kinds of natural or human-made disasters, from floods to nuclear accidents, could occur in this country.

When citizens are unable to cope, the different levels of governments are expected to get involved and to respond progressively as their capabilities and resources are needed. Local emergency response organizations are normally the first on the scene. If they are overwhelmed, their recourse is to seek help through their local authority from the province or territory, which, in turn, will ask the federal government for assistance if necessary.

Legislative Framework

Public Safety and Emergency Preparedness Canada, (PSEPC) is responsible for developing and implementing federal policies for emergency management. Two important Federal Statutes, both adopted in 1988, set out the broad responsibilities of the Government of Canada for emergency preparedness and response.

The *Emergencies Act* defines four categories of emergencies in which the federal government may be required to act: public welfare emergencies, which are the natural or human-made disasters referred to above; public order emergencies (threats to Canada's internal security such as insurrections or acts of terrorism); international emergencies (external threats to the sovereignty, security or territorial integrity of Canada or its allies); and war. The *Emergencies Act* was developed to ensure that the Government of Canada can invoke exceptional -- yet incident-specific -- powers to deal with emergencies. It replaced the *War Measures Act*.

The first two categories fall mostly within provincial jurisdiction, the federal government intervening only when invited or when the situation impinges directly on its own jurisdiction. However, the federal government would have the lead role in any international or war emergency, as these would involve such key areas of federal jurisdiction as military defense, foreign affairs and national security.

The *Emergency Management Act*, introduced in November 2005, updates the old *Emergency Preparedness Acts* and spells out what the federal government and its institutions need to do to ensure that they are always ready to discharge their responsibilities in emergencies. Recognizing that emergencies often require concurrent and coordinated action by many departments and agencies representing different orders of government, the

new Act provides for a comprehensive, all-hazards approach to emergency management by:

- Reflecting the elements of modern emergency management (mitigation/prevention, preparedness, response and recovery, as well as critical infrastructure protection);
- Emphasizing the need for a coordinated and integrated approach to emergency management activities within the Government of Canada;
- Enhancing cooperation with other jurisdictions and the private and voluntary sectors by promoting a common approach and information sharing; and,
- Protecting critical infrastructure information provided by the private sector to the Government of Canada.

The *Emergencies Act* (EA) is often associated with the *Emergency Management Act* (EMA); however, the function of these two statutes is quite different. The EA is the instrument of last resort to deal with emergencies when all other laws in Canada prove inadequate and through the Emergencies Act, Parliament ensures that the Government has the necessary authority to quickly marshal the necessary resources to respond to them. The purpose of the EMA is to address the need to prepare for and respond to emergencies of any kind. The greater majority of emergencies will be dealt with under well-established and well-practiced plans and arrangements developed under the proposed EMA.

Public Safety and Emergency Preparedness Canada (PSEPC)

Public Safety and Emergency Preparedness Canada (PSEPC) was created in 2003 to ensure coordination across all federal departments and agencies responsible for national security and the safety of Canadians.

Like most government organizations, PSEPC has evolved and changed over the years. It began as a civil defense organization in 1948, when civil defense measures were re-instituted in most countries that are now part of NATO, transferring in 1951 from the Department of National Defense to that of National Health and Welfare.

In 1959, it was absorbed into a second civil emergency planning organization, the Emergency Measures Organization (EMO), created two years earlier in the Privy Council Office to ensure continuity of government in Canada through a nuclear attack on North America. EMO thus assumed sole responsibility for all civil aspects of defense policy.

Following a 1966 Cabinet decision giving it the additional responsibility of providing and co-coordinating the federal response to any peacetime disaster, EMO was moved from the Privy Council Office to a succession of different departments, returning to the Privy Council Office in 1974 as Emergency Planning Canada (EPC). This latest change also signaled a shift in emphasis from wartime to peacetime emergencies.

The Minister of National Defense was named Minister Responsible for Emergency Planning in 1984. On July 1, 1986, Emergency Planning Canada's name was changed to Emergency Preparedness Canada to more aptly describe its function. In 1988, the Emergency Preparedness Act made EPC a separate agency reporting to Parliament through the Minister Responsible for Emergency Preparedness, but the organization was returned to the fold of the Department of National Defense as a result of government streamlining measures announced in the 1992 Budget. In February 2000, and as a result of Y2K, Emergency Preparedness Canada changed its name to Office of Critical Infrastructure Protection and Emergency Preparedness (PSEPC), incorporating the federal Government's technical support component into emergency management. The transition into the new millennium revealed to the federal government a major vulnerability that they felt they had not significantly planned for – computers! The name was changed again in 2003 to the current Public Safety and Emergency Preparedness Canada.

Their mandate is to keep Canadians safe from a range of risks such as natural disasters, crime and terrorism.

To do this, PSEPC coordinates and supports the efforts of federal organizations ensuring national security and the safety of Canadians. They also work with other levels of government, first responders, community groups, the private sector and other nations by delivering programs and developing policy in the areas of:

- Emergency Management – working with other levels of government and operators of critical infrastructure (such as utility companies) to help ensure essential services will be available to Canadians during an emergency. They also provide information to help Canadians prepare for emergencies, including guides, websites and public awareness activities such as Emergency Preparedness Week, held annually in cooperation with the provinces and territories;
- National Security – PSEPC runs the Government Operations Centre, which monitors potential threats to the national interest around-the-clock. The Centre can also provide coordination and support in the event of a national emergency.;
- Law Enforcement – PSEPC helps law enforcement agencies put in place the necessary policies and technology for better data and intelligence sharing and contributes funds for policing services in over 300 First Nations and Inuit communities in partnership with provincial and territorial governments;
- Corrections – PSEPC leads the development of federal policy and legislation for Canada's correctional system in order to safely reintegrate offenders into the community. PSEPC also works with the Correctional Service of Canada and the National Parole Board to make the federal correctional system more effective, efficient and accountable;
- Crime Prevention – PSEPC works with volunteer groups, governments and businesses to support local solutions to crime and victimization.

PSEPC also administers the Disaster Financial Assistance program, which provides financial aid to the provinces and territories to facilitate recovery following major disasters, where the cost of recovery would place an undue burden on the provincial or territorial economy.

International cooperation is a vital aspect of PSEPC's work. Through ongoing consultation, PSEPC and the US Federal Emergency Management Agency (FEMA) oversee a multitude of common issues and interests between Canada and the United States in the field of emergency

preparedness and response. Relations with NATO are equally prominent. PSEPC staff represents Canada on the NATO Senior Civil Emergency Planning Committee and NATO Civil Defense Committee. International liaison is fostered with other NATO countries, and PSEPC participates in regular NATO exercises. Cooperative links are also being forged with Central and Eastern European / former Soviet Union countries anxious to advance civil emergency preparedness in their jurisdictions.

Mandate of PSEPC

The mandate of Public Safety and Emergency Preparedness Canada (PSEPC) is to advance civil preparedness in Canada for emergencies of all types, including war and other armed conflict, by facilitating and coordinating the development and implementation of civil emergency plans among government institutions and in cooperation with provincial governments and international organizations. One function of PSEPC is to assist in Emergency Plan Development on a national and an international level, as well as to implement these plans. The Government of Canada established the Joint Emergency Preparedness Program (JEPP) to help ensure that all levels of government across Canada are equally prepared to respond to emergencies. PSEPC administers this program which provides funding and support to emergency preparedness and critical infrastructure protection projects and initiatives.

Effective Emergency Planning – A Fifteen Step Process

1. Pass a By-Law (Legislative Authority)
2. Appoint an Executive Committee of Council
3. Appoint an Executive Committee
4. Appoint an Emergency Program Coordinator & Emergency Planning Committee
5. Reinforce the Planning Purpose and Objectives
6. Conduct a Hazard Risk Vulnerability Analysis (HRVA)
7. Assign Tasks & Actions Based on the HRVA
8. Conduct a Needs Analysis Based on Existing Inventory

9. Commit the previous 8 steps to paper – The Physical Document
10. Consolidate Agency Plans
11. Submit the Plan to the Executive Committee for Review
12. Present Plan to Council/Board for Official Adoption
13. Revise the Plan if the Executive Committee or Council/Board Requests it
14. Educate and Train to the Plan
 - a. Staff and Volunteers
 - b. Public Awareness and Education
15. Exercise the Plan
 - a. Review the Exercises
 - b. Revise the Plan Based on the Review
 - c. Submit to Executive Committee, Council/Board for Review

(Introduction to Emergency Management In British Columbia – produced for the Provincial Emergency Program by the Justice Institute of BC April 2002)

Emergency Plan Implementation

- Monitor any potential, imminent or actual civil emergency and report to government and affected institutions
- Coordinate and support the implementation of emergency plans
- Coordinate and support the provision of federal assistance
- Provide financial assistance when authorized

National Emergency Response Program

The Government of Canada has implemented an all-hazards emergency response framework called the National Emergency Response System (NERS). The system was developed to ensure that Canada can respond appropriately to national emergencies and threats, thus preserving the

safety of its citizens. NERS provides effective coordination of the numerous national players that must act swiftly when national emergencies arise.

The NERS supports effective national leadership and maximizes Canada's capability to identify, plan for and respond to threats or emergencies in the following capacity:

- incident identification
- warning and notification
- information sharing
- incident analysis
- planning
- operations coordination

The Government Operations Centre

The Government Operations Centre (GOC) is Canada's strategic-level operations centre. It is the hub of a network of operations centres run by a variety of federal departments and agencies including the RCMP, Health Canada, Foreign Affairs, CSIS and National Defence. The GOC also maintains contact with the provinces and territories as well as international partners such as the United States and NATO. It operates 24 hours a day, seven days a week, gathering information from other operations centres and a wide variety of sources, both open and classified, from around the world.

The GOC deals with all situations – real or perceived, imminent or actual, natural disaster or terrorist activity – that threatens the safety and security of Canadians or the integrity of Canada's critical infrastructure.

Canadian Cyber Incident Response Centre (CCIRC)

As part of Public Safety Canada, the CCIRC works to mitigate cyber threats to systems that keep Canada's critical infrastructure operating. These include systems such as electrical grids and financial networks. This centre also coordinates the response to any serious cyber security incidents in the country.

Role of Industry Canada

In times of emergency, Industry Canada gives advice and assistance to federal departments and agencies at the national levels. At the district and regional office levels, Industry Canada gives advice and assistance to provincial governments and through provincial governments to local authorities.

In times of emergency, Industry Canada gives advice and assistance to private and public telecommunications undertakings at the district, regional and national levels. Industry Canada has plans in place in the event of emergencies to operate both the regional and national Emergency Operations Centres, and to help facilitate the transportation of personnel and telecommunications equipment through difficult access destinations using primarily military provisions. Industry Canada chairs ten Regional Emergency Telecommunications Committees (RETC) and one National Emergency Telecommunications Committee (NETC) within Canada.

Industry Canada develops and maintains emergency plans and undertakes exercises for telecommunications at the national, regional and district level. Industry Canada also assists the Canadian Emergency Management College (CEMC) in their development of Emergency Telecommunications courses and actively participates by providing course instructors. The purpose of these courses is to familiarize provincial and municipal emergency telecommunications managers with the planning and operational factors affecting municipal emergency telecommunications.

Industry Canada coordinates, in collaboration with PSEPC, the Provinces/Territories and the Telecommunications Industry, the development and establishment of emergency broadcast systems using EXISTING telecommunications facilities, and ensuring the creation of compatible network relays for activation locally, regionally and nationally. Currently, this work is focused on the development, with Environment Canada, of a cablevision-based All Channel Alert system.

With respect to civil emergency preparedness in general, Industry Canada has the responsibility for developing and maintaining civil emergency

plans and programs dealing with, or including, emergency telecommunications within government and industry. Industry Canada manages the *Emergency Response to Disaster Program*. The program assures a prompt provision of emergency telephone lines at the scene of a disaster. Primarily, this involves the maintenance of a contact list to ensure that key telecommunications personnel and organizations are available to support this requirement.

This includes (1) the provision of advice and assistance to federal departments and agencies, as well as provinces and municipalities, (2) coordinating the provision of an emergency broadcast service, and (3) facilitating the provision of appropriate telecommunications equipment or services required for response by federal departments. In close collaboration with the telecommunications industry, it updates a national and regional inventory of equipment. The program also provides advice and assistance to private or public telecommunications undertakings in mitigating the disruptive effects of emergencies on domestic and external communications.

Further, Industry Canada provides guidance, advice and coordination assistance to Canada's national and international telecommunications networks and broadcasting systems with respect to requirements. This includes the coordination and management of programs to ensure the availability of telecommunications to meet federal requirements during periods of system overload or degradation.

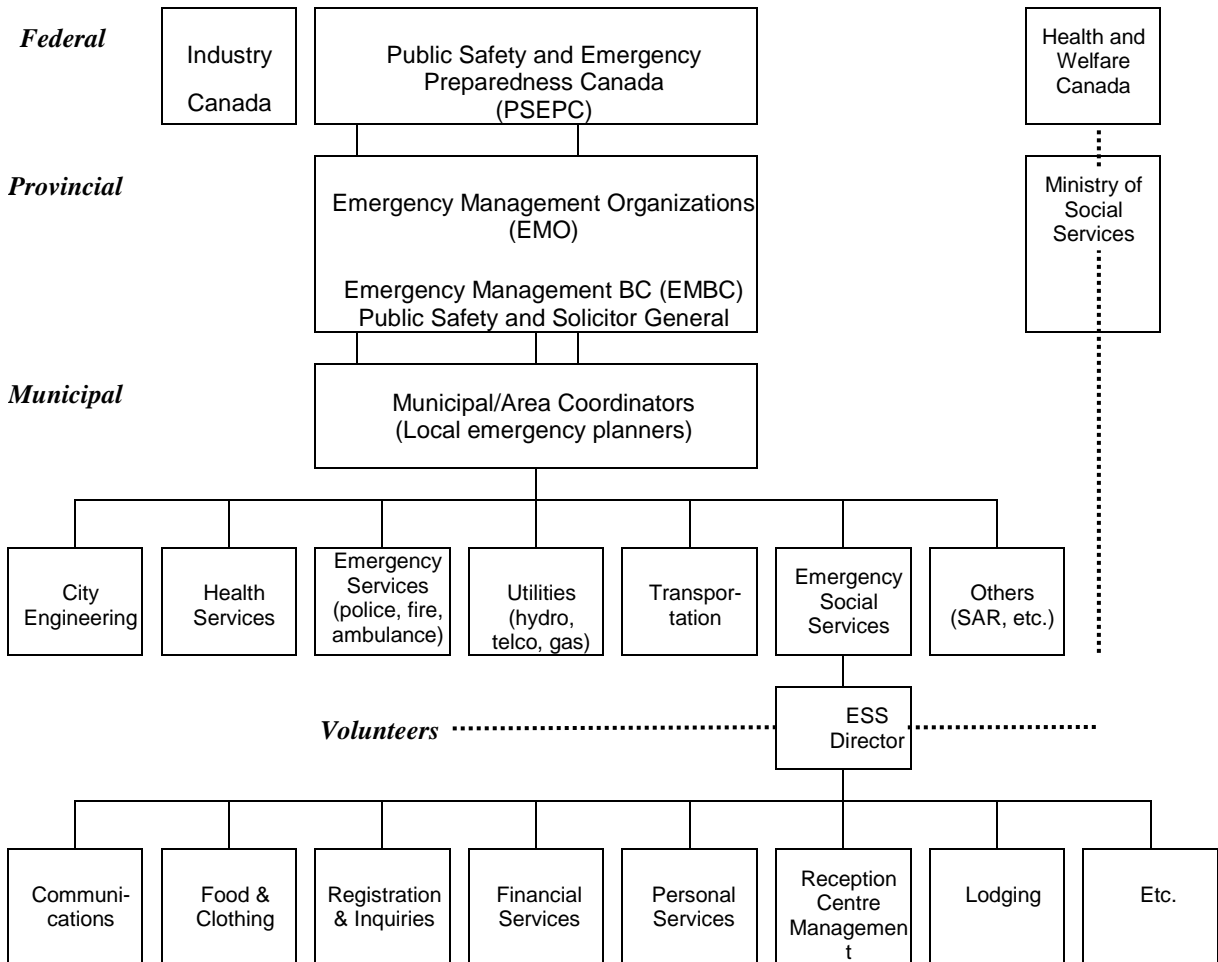
In the event of a major emergency or disaster, the PSEPC Government Operations Centre, 24-hour contact number is (613) 991-7000 and the GOC watch officer will coordinate with PSEPC staff as required.

Provincial Legislation

In the Appendices at the end of the text there are descriptions of various Canadian provincial legislation and Provincial Emergency Preparedness legislation. As awareness of the results of disaster becomes more prevalent in Canadian society, we are seeing a greater convergence in the types of legislation and its implementation. There will always be a regional and local focus depending on the types of anticipated emergencies and disasters for a given area.

Responsibilities of Government and Designated Departments

Although the following diagram gives an overview of how the British Columbia government and volunteers are structured in Canada it is indicative of how most provinces and territories are structured Canada wide.



Chapter 5: Being Ready for Emergencies

For the most part, disasters are low-probability events. Although disasters in Canada are newsworthy events, they are infrequent occurrences in this country. More often we hear of incidents elsewhere. Therefore, because of low frequency, Canadian emergency preparedness has only become increasingly established within the last three decades.

Expect the Unexpected – Plan for it!

This chapter has been adapted from Safe Guard, a PSEPC national public information program.

In daily living, major emergencies or disasters may seem a remote possibility. Yet earthquakes, tornadoes, floods and dangerous goods spills can strike any community, including yours. If you are unprepared for a disaster, it can shatter your life. If you are prepared, you can tip the balance between being a victim or a survivor. Victims believe that major disasters occur in someone else's neighbourhoods. Victims do not plan for emergencies, so, when a disaster strikes, victims are often overwhelmed by stress, trauma and injury. Survivors, on the other hand, expect the unexpected and plan for it. They know what to do in a crisis. When a disaster strikes, survivors are in better control and can get back on their feet more quickly.

No community is equipped to handle all the demands of a catastrophe. As a public safety communicator, you can help your community by preparing yourself. It is a well-known fact that those workers who are personally prepared and know that their families are well prepared, too, will remain longer on the job and is able to be effective.

A public safety communicator is considered part of the lifeline of the community when an emergency, major emergency or disaster strikes. When a major event happens, in your role as a public safety communicator, you may be well prepared yourself, but it is critical that all types of responders have a good understanding of what is occurring in the field. Understanding how your community responds will assist you in making those correct and informed decisions when addressing resource management on the job.

In order to respond to any type of emergency situation, there must be an established protocol of coordination. Routine emergency operations require familiar communication tasks and goals that are predetermined by tradition. Further, most response agencies operate under both organizational rules and regulations, and Standard Operating Procedures (SOPs) or standard operating guidelines. However, when a community responds as a whole, it is the emergency plan that provides the framework from which an efficient coordinated effort stems.

How is a community able to manage several responding agencies in a coordinated effort to save lives, protect property and the environment in response to a major event? To respond appropriately, communities engage in the emergency planning process. By planning before a disaster occurs, communities and agencies can realistically determine:

- the types of emergencies they may experience in their particular area;
- an inventory of the resources and equipment they may need;
- the educational needs of the local residents, in order to offer preparedness programs on particular hazards, and on how to avoid becoming a victim;
- how to establish relationships with industry and other communities for expeditious assistance when it needed.

Planning ahead when things are calm is much easier and more productive than in the midst of confusion in an unforeseen disaster. As a result of the planning process, emergency plans are developed and ready to be implemented. Emergency Measures Ontario states that a good plan should:

- identify who can declare an emergency, and once declared, who directs the emergency response, and
- indicate local officials and staff who should be notified.

This plan should also identify:

- the responsibilities of local emergency responders – police, firefighters, health and social service workers – in dealing with the emergency,

- assistance available from provincial or federal governments, neighborhoods, communities or volunteer groups, such as amateur radio or the Red Cross,
- resources available within the community, such as shelter and food for evacuees, and
- what to do if electricity, gas or water services are interrupted.

Elements of Effective Emergency Planning

Effective emergency planning is a part of emergency preparedness and must include the following factors to be effective:

- Hazard Risk Vulnerability Analysis (HRVA) – A scientific based process that identifies, in priority, community’s most prevalent hazards and the consequences of the hazards the purpose of this is to possible prevent or at least mitigate the effects of hazards the community’s are most at risk from. Using the City of Kamloops as an example, the city lies in the confluence of the North and South Thompson Rivers. Each spring approximately 1/3 of the city is at risk from flooding. Using an HRVA the city has identified flooding as being a high priority on their list of hazards. As such the city has built dikes to protect the populated areas at risk. The dikes are built to a 1 in 20 year flood plain level (due to costs the dikes are not built to a 200 year flood plain level); thus the city is mitigating the risk not eliminating it.
- a well-defined method of training of all levels of response personnel in their roles and responsibilities; response personnel in this case is not restricted to just emergency services first responders, rather it is meant to be inclusive of all personnel who maybe called in to assist during an event. (for example, emergency communicators, public works personnel, amateur radio volunteers, Emergency Social Services volunteers, Search & Rescue volunteers, clerical and administrative personnel etc.);
- a public education/preparedness outline.

- a method of testing through designed exercises such as drills, tabletop simulation exercises, functional and full-scale exercises to determine strengths and weaknesses (what works and does not work);
- revision of the plan, incorporating the exercise lessons learned (This makes the emergency plan a *living document*);
- and finally, any additional training, re-testing and further adjustments needed to keep the plan current.

It should be noted that as the profile of the community changes, whether it be industrial, social or technological, the community emergency plan should be amended to address any issues or problems these elements will introduce. Therefore, emergency planning is not static, but an on-going process. Public safety communicators will not only be participating in an exercise that may or may not involve operational personnel, but it is important to note that they are a critical component of emergency management. This is true whether it is for exercises or actual incidents.

(end of adaptation)

Effective Communication and Emergency Planning

Public safety communications is the lifeline between the public and the emergency responders. Without effective communications, emergency response is guaranteed to fail. Problems with communications – equipment, radio frequencies, etc., as well as the human element of communication in the form of information sharing – are areas that are critically reviewed during the planning process *prior* to a disaster. As a result, emergency communications plans are pre-planned responses to major unpredictable events.

A communications plan is contained within the framework of an emergency plan as a whole. Additionally, there may be specific procedures relevant to particular hazards as well as evacuation and fire procedures. The communication plan will include information such as the policies and procedures for notification of appropriate personnel, call out/fan out lists, organizational flow charts, and a resource inventory of contacts and resource supplies. It may also incorporate a Communications Contingency

Plan. This plan advises contingencies and contacts for problems with communications equipment.

Communications may flow in several directions:

- from the public to the public safety communicator to the first responder
- from the first responder on the scene to the public safety communicator
- in a major incident or disaster, from the Incident Site Command to the Emergency Operations Centre (EOC) and vice versa
- from the public via the public safety communicators to the EOC
- media releases of public information, controlled by the Information Officer.

A noteworthy example of effective communications in an emergency is the 1997 Red River Flood in Winnipeg, Manitoba. Large numbers of well-trained personnel, as well as a multitude of volunteers, assisted in a planned and organized response, which mitigated suffering and hardship of many Manitoba citizens. Winnipeg's Emergency Public Inquiry Call Centre is a perfect example of an effective communications Centre. It was staffed by 253 persons who during the peak of April 29-30 handled 12,560 calls, with the total number of calls reaching 108,954 (April 21 – May 7). The roles and functions of the staff were:

- to handle all telephone calls from the public,
- to relay accurate and confirmed information to the public,
- to gather information from public calls and relay same to EOC for confirmation /response,
- and to work closely with the media Centre to correct rumors and misinformation identified from public calls.

The call Centre served to reduce anxiety and keep the general public as well as responders and officials informed with up-to-the-minute correct information. Internet access to the flood website by the public indicated 14,812 hits at the zenith on May 1, with a total number of 123, 024 hits

from April 17 – May 7. It is suggested that the greatest number of hits were from the media. The website was updated every five minutes.

Emergency Preparedness and Response

Emergency preparedness includes a number of measures such as emergency plans, mutual-aid agreements, resource inventories, warning procedures, training, exercises and emergency communication systems. *Major emergency or disaster response* is always multi-organizational in nature and encompasses many agencies, perhaps various geographic jurisdictions, and all the people in the affected area.

In a major emergency or disaster response:

- management approaches used for day-to-day public bureaucracies and private firms are not sufficient;
- new inter-agency relationships must be quickly established to ensure a total response is supplied;
- it must be determined who is in charge;
- authority relationships must be determined; and
- evaluations of response effectiveness must be directed at the *network* of emergency response entities rather than at any one agency or individual.

It is therefore vital to establish an Emergency Operations Centre as soon as possible once it appears an emergency may evolve into either a major emergency or a disaster.

Emergency Management

Emergency management is a comprehensive worldwide management system used to prevent, mitigate, respond and recover from emergencies, major emergencies and disaster events by, all levels of international government, private sector agencies and individuals. The Introduction to Emergency Management in British Columbia course at the Justice Institute of BC outlines seven components of emergency management as:

1. **Context** is the environment surrounding the impact of different events on a community. For example, if a propane tanker rolled into a ditch on a highway causing propane to leak in an unpopulated area, the resulting

impact would be far less on people than if the tanker were to roll over and leak propane in a densely populated location.

2. **Hazard Risk Vulnerability Analysis** is a scientific process used to determine the most prevalent hazards to a community, as well as identifying the impacts of these hazards should an incident occur in the community.
3. **Preparedness** is designed to ensure that individuals and agencies will be ready to react effectively once emergencies have occurred. These include measures such as emergency plans, mutual aid agreements, resource inventories, warning procedures, training, exercises, public education (personal preparedness) and an emergency communications system.
4. **Mitigation** is the works **constructed** to either prevent or lessen the impacts of disaster events on communities. Examples of this are, dikes for mitigating floods, seismic retrofitting to mitigate the effects of earthquakes on structures, minimizing combustibles materials on properties to lessen the risk of structural fires during a wild land urban interface fire threat.
5. **Response** is the action that is taken to mitigate the effects of emergencies as they are occurring and include measures such as the implementation of emergency plans, activation of the Emergency Operations Centre, mobilization of resources, issuance of warnings and directions, provision of medical and Emergency Social Service activities, and declaration of States of Emergencies, (if necessary, as enabled by appropriate legislation).
6. **Recovery** is designed to help restore the environment or communities to their pre-emergency condition, and include measures such as physical restoration and reconstruction, economic impact studies, personal counseling, financial assistance programs, temporary housing and health and safety information.
7. **Review** is a process that is conducted once the recovery phase is near completion or has been completed. The purpose of reviews is to follow up on what worked well and what didn't work during an event in order to adapt emergency plans and response techniques to mirror lessons learned during response.

Differences Between Prevention and Planning

Prevention measures, such as building codes, building use regulations, zoning and land use management, assist in reducing the risk or vulnerability of an emergency occurrence. Emergency planning and training will mitigate or lessen the impact of the consequences.

Disaster Vulnerability

Not only are we more aware of disasters locally and around the world due to greater media access, we are in fact more vulnerable to disasters because of inhabitation of high-risk areas, increased population density, and increased dependency on technology.

Inhabitation of High-Risk Areas

Vulnerability to disaster is increased when highly vulnerable areas are inhabited, such as flood plains in Manitoba and British Columbia's Fraser River Delta, unprepared hillsides, active earthquake zones, airports such as Toronto's Pearson airport and the nuclear plants of Ontario.

Increased Population

The increasing concentration of population raises the number of potential victims of disaster. Consequently, when hazards such as tornadoes or hurricanes do occur, losses tend to be greater than those in the past. For example, Vancouver Island was struck with a M7.3 earthquake on June 23, 1946. Although there were no casualties, the event was felt as far south as Portland, Oregon and east to Kelowna, British Columbia. Total financial losses from the earthquake were about \$10 million. If a similar earthquake were to strike today, there could be significant loss of life as well as many more millions of dollars in damage and loss because of the higher population density, both residential and commercial.

The Lower Mainland of British Columbia is expecting the *big one* to strike at any time.

A recent study of the economic impact of a hypothetical M6.5 crustal earthquake with a focus of 10 km beneath Vancouver provides a worst-case scenario of the damage that could be expected from a large earthquake in the region. The study concluded that the total economic loss from such an earthquake would be between Cdn \$14 to \$32 billion (Munich Reinsurance Company of Canada, 1992).

The population figures for the Greater Vancouver Regional District reflect the increase of population for this high-risk area: In 1951, the population for the area was just 586,000; in 1991, the population had grown to 1,602,000. By 2021, the population is expected to increase to 2,676,000 persons. A destructive earthquake in 2021 would have an unimaginable impact on public safety communicators.

Technological Risks

Toxic waste processing, the transportation of dangerous goods, and increased dependency on computer systems are but a few technological factors that increase the risk of disaster. It is commonly known that approximately 10 percent of all trucks and 35 percent of all freight trains carry dangerous cargoes. Canada's premiere technological incident occurred in Mississauga, Ontario, November 1979. As a result of a train derailment, there was a dangerous goods spill, which led to the evacuation of 250,000 people. In broader terms, the event provided the motivation to remedy the great need of emergency preparedness across the nation. More recently, in 1992 another dangerous goods spill took place at Oakville, Manitoba. Four hundred persons were evacuated for 24 days.

As our dependence on information systems grows, a power interruption could have a lasting effect. When a disaster strikes and takes out the electrical supply, it could disable the computer systems upon which our banking and financial institutions depend and which interconnect with the rest of Canada. This could result in a monetary crisis.

Chapter 6: Personal and Family Preparedness

Need for Personal and Family Preparedness

The emergency preparedness of individuals and families is commonly accepted as necessary. The preparedness of families of public safety communicators, like other emergency service personnel, is an absolute necessity. The ability of emergency service workers to perform their professional duties competently depends in part on their confidence in how well their families and homes are prepared to cope with emergencies in their absence.

All families need to be aware of the following:

- Hazards exist everywhere in our homes and communities
- All family members and pets should have emergency kits
- A family emergency plan should be made and exercised regularly

The families of public safety communicators need to be aware of the following:

- Emergency services workers are often required to report to work ASAP
- Family members may be separated for extended periods
- Public may be without assistance for at least 72 hours
- The emotional and psychological effects of crisis situations

Elements of Personal Preparedness

There are four components of personal preparedness for a major emergency.

- Out-of-area or province phone contact(s) for relaying information to separated family members.
- Personal emergency kits
- Vehicle emergency kits
- First aid kits (along with First Aid training)

Home Preparedness

The assessment and preparation of residences is fundamental because of the likelihood that major emergencies will occur when some or all family members are at home. Attention to the following areas will provide a sound preparation:

- Evacuation plan for the home
- Hazard analysis
- Hazard mitigation
- Safety procedures
- Training and practice

Training for the home preparedness plan and regular practice of it helps keep the appropriate procedures fresh in family members' minds, and provides insight for revision of the plan itself.

Essential Components of the Family Emergency Plan

The following list is a generic list of plan components. It should be adapted to cover the particular needs of each family and their residence.

- Family member information and photos
- Emergency telephone contact list
- Out-of-province phone contact
- Exercise and update schedule
- Safety procedures for gas, water, and electrical shut off
- House floor plan with marked escape routes
- Designated family meeting place
- Provision for safety upgrading of home including: water heater tie-down, foundation anchoring, appliance anchoring, picture hanging, cupboard closures, etc.
- Lists of emergency pack contents
- Emergency services and shelter locations

Evacuation Plan

- Diagram of house floor plan
- Designates 2 escape routes from each room
- Includes all possible emergency exits
- Designates a meeting place
- Includes any special assistance or procedures needed for family members
- Include important features or problems
- Exercise
- Update the plan on a regular basis

Hazard Analysis

- Look for all obvious safety hazards
- Look for objects that could become unsafe
- Notice what is above your head
- Know what is behind closed doors

Hazard Mitigation

- Eliminate the hazard
- Tie down loose, heavy objects
- Move furniture and pictures/art
- Have home inspection performed
- Obtain safety equipment

Safety Procedures

- Gas shut-off
- Power shut-off
- Water shut-off
- Fire-fighting
- Drop and cover drill

- First aid

Training and Exercising

- Have regular family meetings
- Practice safety procedures regularly – *Have a show and tell.*

If you live in a house:

- Teach members of your family where and how to shut off the water, electricity and gas supply.
- Make big easy-to-see signs saying Breaker Panel (or main circuit breaker), Gas and Main water supply. Put these signs near the breaker panel, gas valve and main water main.

If you live in an apartment:

- Show everyone in your family where the emergency exit is located and practice using it.
- Show them where the fire alarm is, and explain when and how to use it. In a fire or other emergency, do not use the elevators. You will be trapped in the elevator if the power goes out.

In addition:

- Attend a first aid course
- Exercise the evacuation plan fully each year

Your neighborhood:

- Learn about other community emergency plans. Your child's school and your workplace might have their own emergency plans. Find out what they are and how they apply to you. You may be separated from your family and need to know how to get reunited. You can assist in educating your children about school and community plans.
- Does your community or municipality have a Neighbourhood Preparedness Program?

Emergency Kits

Each home and each vehicle should be equipped with kits that are located where they are likely to be accessible in an emergency. Aim to have an emergency kit that will keep you and your family self-sufficient in your home for *at least three days*.

Personal Emergency Kits

These should include:

- One or more out-of-province phone contact or more
- Clothing and good shoes
- Extra pair of eyeglasses
- A small amount of cash and change. For instance, there should be some quarters for using a pay phone, automated bank machines may be rendered inoperable by the disaster event
- Personal identification
- Food and water provisions
- A sign with *SOS* (HELP) on one side and *OK* on the other
- First-aid kit, including any regular medication needed
- Sanitary and personal hygiene supplies
- Some basic tools (a flashlight, batteries, a hammer, a screwdriver)
- A blanket
- Disposable dust mask
- A family picture (helps a field unit to identify how many people live in the house and what they look like)
- Plastic bags
- AM/FM portable radio

Family Emergency Kits

These should include:

- One or more out-of province contacts

- Blankets
- A small amount of cash
- A sign with *SOS* (HELP) on one side and *OK* on the other
- Cooking equipment and supplies
- Water and food supplies
- Water purification tablets
- Extra waterproof clothes and gloves
- Disposable dust masks
- A waterproof tarp
- Hand tools, flashlight, extra batteries
- Waterproof matches and candles
- A comprehensive first aid kit, including any medication needed by family members with chronic conditions such as asthma or diabetes
- Sanitary and personal hygiene supplies
- Plastic bags
- Toys and games
- AM/FM portable radio, extra batteries

Vehicle Emergency Kits

These should include:

- A first aid kit
- Food – power bars with a long shelf life, gum, and so on
- Water
- A flashlight
- A whistle
- Battery booster cables
- A tool kit

- A blanket and tarp
- Money, including coins
- Basic toiletries
- A siphon hose
- Clothing and comfortable shoes
- Waterproof matches and candles
- A sign, with *SOS* (HELP) on one side and *OK* on the other
- One or more out-of-province phone contact
- A supply of disposable dust masks

Pet Emergency Kits

These should include:

- Food and water (including bowls)
- A blanket
- Toys
- Vaccination and veterinary records (a copy)
- A transportation container
- Leashes
- Special equipment, provisions or medication

Know What To Do During a Disaster

Here are some basic procedures prepared by Emergency Preparedness Canada for four types of disasters.

During an Earthquake

If you are in a building – Stay inside away from windows. Get under a heavy desk or table and hang on. If you cannot get under something strong, flatten yourself against an interior wall; protect your head and neck.

If you are outside – Go to an open area. Move away from buildings or any structure that could collapse. Stay away from power lines and downed electrical wires.

If you are in a car – Stop the car and stay in it. Avoid bridges, overpasses or underpasses, buildings or anything that could collapse on you or your vehicle.

During a Tornado

If you are in a building – Go to the basement. If there is not one, crouch or lie flat (under heavy furniture in an inner hallway or small inner room or stairwell away from windows. Stay away from large halls, arenas, shopping malls, and so on (their roofs could collapse).

If you are caught outside – If there is no shelter, lie down in a ditch or ravine, protecting your head.

If you are driving – Get out of and away from the car. It could be blown through the air, or roll over on you. Lie down, protecting your head.

During a Severe Lightning Storm

If you are in a building – Stay inside. Stay away from windows, doors, fireplaces, radiators, stoves, metal pipes, sinks or other electrical charge conductors. Unplug TVs, radios, toasters and other electrical appliances. Do not use the telephone or other electrical equipment.

If you are outside – Seek shelter in a building, cave or depressed area. If you are caught in the open, crouch down with your feet close together and your head down (the “leap-frog” position). Do not lie flat – by minimizing your contact with the ground you reduce the risk of being electrocuted by a ground charge. Keep away from telephone and power lines, fences, trees and hilltops. Get off bicycles, motorcycles, and tractors.

If you are in a car – Stop the car and stay in it. Do not stop near trees or power lines that could fall.

During a Flood

If you are in a building – Turn off basement furnaces and the outside gas valve. Shut off the electricity. If the area around the fuse box or circuit breaker is wet, stand on a dry board and shut off the power with a dry wooden stick.

If you are caught outside – Never try to cross a flood area on foot, because the fast water could sweep you away.

If you are in a car – Try not to drive through floodwaters. Fast water could sweep your car away. However, if you are caught in fast rising waters and your car stalls, leave it and save yourself and your passengers.

Know What To Do After a Disaster

Right after the emergency, you may be confused or disoriented. Stay calm and remember the following procedures.

Help The Injured – Help anyone who is injured. Get your emergency survival kit (the first-aid kit should be with it).

Listen To The Radio – Listen to your local radio station on your battery-operated radio for instructions.

Do Not Use The Telephone – Do not use the telephone unless it is absolutely necessary. Emergency crews will need all available lines.

Check Your Home – Check for damage to your home. Remember the following points:

- Use the flashlight – do not light matches or turn on the electrical switches if you suspect damage.
- Check for fires, fire hazards or other household hazards.
- Sniff for gas leaks, starting at the water heater. If you smell gas or suspect a leak, turn off the main gas valve, open windows and get everyone outside quickly.
- Shut off any other damaged utilities.
- Clean up spilled medicines, bleaches, gasoline and other flammable liquids immediately. Wear protective clothing. For major spills or leaks call in professional help.
- Confine or secure your pets.
- Check on your neighbours, especially the elderly or people with disabilities.

If you turn off the gas, it must be turned back on by a professional from the gas company.

Watch for More Hazards

Think about the Hazards you should watch for after a major disaster.

Post Earthquake Hazard	What to Do
Damaged buildings	Stay out of damaged buildings, even if they look okay.
Aftershocks	Stay put.
Water gets cut off	Use emergency water from water heater, toilet tank, melted ice cubes.
Power can go off	If you live in an apartment, do not use the elevator. You may get stuck in it.
Tsunami (huge ocean wave)	If you live near the ocean, stay away from the waterfront.
Post-Flood Hazard	What to Do
Contaminated drinking water	Use bottled water or bring water to a rolling boil for five minutes, or add two drops of household bleach to one litre of contaminated water. Stir and wait 15 minutes before drinking. (Water should still have a slight chlorine smell).
Contaminated dishes and utensils	Wash and sterilize dishes and utensils. Use hot water, detergent and a disinfectant rinse (approximately one teaspoon of household bleach in a sink of water).
Basement full of water	Drain the water in stages, about a third of the volume of water per day. (Draining the water too quickly can structurally damage your home)
Contaminated flood water in the basement	If the flood is severe and the house is flooded for an extended period, disinfect the water every three days. For the average home, mix two litres of liquid bleach into the floodwater.

Other Hazards	What to Do
Loose or dangling electrical wires	Stay away. Advise the authorities if you can.
Broken sewer and water mains.	Advise the authorities if you can.

Be Ready to Evacuate

If the emergency is serious enough, you may be asked to leave your home and go to a nearby evacuation Centre, like a school gym or a community hall.

- Leave immediately.
- Take your emergency survival kit with you.
- Listen to the radio and follow instructions from local emergency officials.
- Wear clothes and shoes appropriate to conditions.
- Lock the house.
- Follow the routes specified by the officials. Do not take shortcuts. A shortcut could take you to a blocked or dangerous area.
- If you are instructed to do so, shut off water, gas and electricity.
- Make arrangements for pets.
- If you have time, leave a note telling others when you left and where you went. If you have a mailbox you could leave a note there.
- If you are evacuated, sign up with the registration Centre so you can be contacted or reunited with your family and loved ones.

Expect Emotional Reactions

You Won't Feel Like Yourself for Awhile

Most people caught in a disaster usually feel confused. They may tremble, feel numb, vomit or faint. Immediately after the disaster they often feel

bewildered, shocked, and relieved to be alive. These feelings and reactions are perfectly normal.

Later many survivors sleep poorly, have no appetite, and are angry with those around them, or panic at the slightest hint of a storm. Children might start thumb sucking or bed-wetting. These feelings and reactions are perfectly normal.

How to Get Back on Track

Here are some suggestions to help get yourself and your family back on track after the disaster.

Recognize that when you suffer a loss, you grieve. (Yes, you can grieve the loss of a wedding photo or your grandfather's favourite ring). Feeling apathetic. Feeling hostile. Not sleeping or eating well. These are grief reactions. You and your family need time to heal.

Talk about your feelings. Talk about what has happened. Get your children to express their feelings. They may want to do this by drawing or playing instead of talking. Understand that their feelings are real.

Concentrate on the Children

During and after a disaster, your children will look to you for help and guidance. How you react to the situation gives them clues on how to act. If you show fear, they will probably get really scared. Even if you show no fear, they will probably feel anxious.

A Child Who Feels Afraid, Is Afraid.

After a disaster, children are most afraid that:

- the event will happen again,
- someone will get hurt or injured,
- they will be separated from the family, and/or
- they will be left alone.

Comfort and reassure them. Tell them what you know about the situation. Be honest, but gentle. Encourage them to talk about the disaster. Encourage them to ask questions about the disaster.

Give them a real task to do, something that will help get the family back on its feet. Keep them with you, even if it seems easier to look for housing or help on your own. At a time like this, it is important for the whole family to stay together if at all possible.

(Material in this chapter adapted from brochures produced by: Canadian Red Cross, Public Safety and Emergency Preparedness Canada, Provincial Emergency Program, Terasen, BC Hydro, and Emergency Social Services Headquarters Ministry of Human Resources)

Chapter 7: Workplace Preparedness

Being prepared for emergencies at the workplace is as important as being prepared personally. The task is more complex in that a greater number of people are involved. The greater numbers further complicate responses to a major emergency be it the management of injury or evacuation.

Preparedness starts with an audit for hazards and available resources.

Workplace Hazards

The following are a few of the aspects of a workplace to examine when auditing it for potential hazards, prior to developing a complete emergency plan.

- Personnel
- Transportation
- Facilities
- Nearby industries
- Dangerous goods storage and transportation
- Support services
- Power supplies and requirements
- Telephone systems
- Radio systems
- Data information systems
- Computer networks
- Office autonomy
- Mobile systems
- Inter-organizational links

Capabilities

This process entails gathering information about current capabilities and about possible hazards and emergencies, and then conducting a vulnerability analysis to determine the facility's capabilities for handling emergencies.

Identify Internal Resources and Capabilities

Resources and capabilities that could be needed in an emergency include:

- Personnel – fire brigade, hazardous materials response team, emergency medical services, security, emergency management group, evacuation team, public information officer.
- Equipment – fire protection and suppression equipment, communications equipment, first aid supplies, emergency supplies, warning systems, emergency power equipment, and decontamination equipment.
- Facilities – emergency operating centre, media briefing area, shelter areas, first-aid stations, sanitation facilities.
- Organizational capabilities – This includes training, evacuation plan, and employee support system.
- Backup systems – arrangements with other facilities to provide for:
 - Payroll
 - Communications
 - Production
 - Customer services
 - Shipping and receiving
 - Information systems support
 - Emergency power
 - Recovery support

Identify External Resources

There are many external resources that could be needed in an emergency. In some cases, formal agreements may be necessary to define the facility's relationship with the following:

- Local emergency management office
- Fire department

- Hazardous materials response
- Emergency medical services
- Hospitals
- Police
- Community service organizations
- Utilities
- Contractors
- Suppliers of emergency equipment
- Insurance carriers

Vulnerability Analysis

To conduct a vulnerability assessment, consider the hazards specific to the workplace as well as to the overall department/company operations. This activity is a small but essential part of the considerations necessary for the development of a comprehensive emergency plan at a workplace. The steps involved in conducting a basic vulnerability assessment are outlined below.

List Potential Emergencies

In the *first column* of the chart, list all emergencies that could affect your facility, including those identified by your local emergency management office. Consider both:

- Emergencies that could occur within your facility
- Emergencies that could occur in your community

Some other factors to consider:

Historical – What types of emergencies have occurred in the community, at this facility and at other facilities in the area?

- Fires
- Severe weather
- Hazardous material spills
- Transportation accidents
- Earthquakes

- Hurricanes
- Tornadoes
- Terrorism
- Utility outages

Geographic – What can happen as a result of the facility’s location? Keep in mind:

- Proximity to flood plains, seismic faults and dams
- Proximity to companies that produce, store, use or transport hazardous materials
- Proximity to major transportation routes and airports
- Proximity to nuclear power plants

Technological – What could result from a process or system failure? Possibilities include:

- Fire, explosion, hazardous materials incident
- Safety system failure
- Telecommunications failure
- Computer system failure
- Power failure
- Heating/cooling system failure
- Emergency notification system failure

Human Error – What emergencies can be caused by employee error? Are employees trained to work safely? Do they know what to do in an emergency? Human error is the largest single cause of workplace emergencies and can result from:

- Poor training
- Poor maintenance
- Carelessness
- Misconduct

- Substance abuse
- Fatigue

Physical – What types of emergencies could result from the design or construction of the facility? Does the physical facility enhance safety?

Consider:

- The physical construction of the facility
- Hazardous processes or byproducts
- Facilities for storing combustibles
- Layout of equipment
- Lighting
- Evacuation routes and exits
- Proximity of shelter areas

Regulatory – What emergencies or hazards is your facility regulated to deal with? Analyze each potential emergency from beginning to end.

Consider what could happen as a result of:

- Prohibited access to the facility
- Loss of electric power
- Communication lines down
- Ruptured gas mains
- Water damage
- Smoke damage
- Structural damage
- Air or water contamination
- Explosion
- Building collapse
- Trapped persons
- Chemical release

Estimate Probability

In the *Probability* column, rate the likelihood of each emergency's occurrence. This is a subjective consideration, but useful nonetheless. Use a simple scale of 1 to 5, with 1 as the lowest probability and 5 as the highest.

Assess the Potential Human Impact

Analyze the potential human impact of each emergency, and the possibility of death or injury. Assign a rating in the *Human Impact* column of the Vulnerability Analysis Chart. Use a 1 to 5 scale with 1 as the lowest impact and 5 as the highest.

Assess the Potential Property Impact

Consider the potential property for losses and damages. Again, assign a rating in the *Property Impact* column, 1 being the lowest impact, and 5 being the highest. Consider:

- Cost to replace
- Cost to set up temporary replacement
- Cost to repair

Example: A bank's vulnerability analysis concluded that a small fire could be as catastrophic to the business as a computer system failure. The planning group discovered that bank employees did not know how to use fire extinguishers, and that the bank lacked any kind of evacuation or emergency response system.

Assess Internal and External Resources

Next assess your resources and ability to respond. Assign a score to your Internal Resources and External Resources. With a lower score being better than a higher score.

To help you do this, consider each potential emergency from beginning to end and each resource that would be needed to respond. For each emergency ask these questions:

Do we have the needed resources and capabilities to respond? Will external resources be able to respond to us for this emergency as quickly as we may need them, or will they have other priority areas to serve? If the answers

are yes, move on to the next assessment. If the answers are no, identify what can be done to correct the problem. For example, you may need to:

1. Develop additional emergency procedures
2. Conduct additional training
3. Acquire additional equipment
4. Establish mutual aid agreements
5. Establish agreements with specialized contractors

Add the Columns

Total the scores for each emergency. With a lower the score being better than a high score. While this is a subjective rating, the comparisons will help determine planning and resource priorities.

NOTE: When assessing resources, remember that community emergency workers – police, paramedics, and firefighters – will focus their response where the need is greatest. Or they may be victims themselves and be unable to respond immediately. That means response to your facility may be delayed.

See Sample Vulnerability Analysis Chart on the following page.

Sample Vulnerability Analysis Chart

Potential Emergency	Probability	Human Impact	Property Impact	Internal and External Resources

Chapter 8: Emergency Response Phases

A major emergency cycle generally goes through six phases. Activities within the cycle can generally be identified with a particular phase, though activities in some phases may overlap. Identifying the phases is helpful in determining appropriate action, and for follow-up evaluation of the incident.

1. Alert Phase

During the initial period, the occurrence of the incident is detected and the reports are conveyed to one or more agencies. Agencies then ensure that their responders and other agencies are informed through predetermined protocols. These methods include use of fan-out techniques to spread the responsibility of notification to a large number of people and reduce the time required to mobilize responders.

The notification of the public at this phase serves to reduce phone traffic and can aid in preparing the community for future action such as evacuation. Often the media is used through public safety/awareness announcements.

2. Mobilization Phase

Once the initial assessment of the situation has occurred, decisions are made about how the situation will be addressed initially. This includes which responders are dispatched and the alert of supporting agencies such as hospitals and organizations responsible for emergency transportation. The non-emergent functions of the agencies are put on a lower priority to free up resources for the major emergency.

Decisions are also made regarding the command and control functions, and whether or not to set up an Emergency Operations Centre and an on-site Incident Command Post (ICP). Depending on what is known at this point, a Local State of Emergency may be considered if extraordinary powers are warranted.

The mobilization phase is the phase in which the deployment of resources is initiated. However, there are primarily two areas of resource management concerns, which complicate this phase. They are the problem

of over-response (convergence) and inter-organizational resource management.

Disasters pose problems for resource management that are different from those in daily emergencies. Disaster tasks may require the use of resources (personnel, facilities, supplies, and equipment) from multiple organizations and jurisdictions and may also require the use of unusual resources. Much of the emphasis of disaster planning in many communities has traditionally been on the mobilization and reinforcement of resources. And, indeed, however, it has been recognized that uncontrolled mobilization and over-response are common problems in disasters. When they occur, coordination of response can be significantly complicated. (Auf de Heide, 1989).

Over-Response

Over-response, also referred to as *convergence*, is when there is uncontrolled, uncoordinated and unsolicited coming together of resources at a particular site. This could potentially overwhelm the Incident Commander's ability to manage site level activities. An additional consequence of over-response can be lack of resources remaining available for other incidents.

A classic example of the consequence of over-response occurred during the *activation phase* of the, July 31, 1987, Edmonton Tornado. The tornado first struck in Edmonton on the south side of town on 34th street at 3 pm. It continued on a northerly path towards the Strathcona Industrial Park on the east side of town, where it caused catastrophic damages to the industrial area. It also derailed a CN freight train transporting anhydrous ammonia. Eleven workers were killed and countless others trapped in the industrial park. The Edmonton emergency services dispatch centres responded all available equipment and personnel to the industrial park. Approximately forty-five minutes later a call was received by Edmonton's 9-1-1 dispatch centre from Alberta Hospital, a psychiatric facility located ten kilometres northeast of Edmonton in the community of Oliver Alberta. The caller stated that the Evergreen Mobile Home Park in the northeast corner of Edmonton had been struck by a tornado. Out of all the emergency services resources in the city, only a single ambulance was left available to respond to the trailer court. This ambulance was stationed at the Misrecordia

Hospital in the far west end of the city, a 45-minute response time to the trailer court. The tornado killed 16 men, women, and children in the trailer court.

Another form of convergence occurs when public safety communicators, volunteer organizations, and response agencies become inundated with calls from volunteers, off-duty emergency personnel and contractors wishing to offer their services. The effects of this type of convergence can be mitigated with a contact point, referred to as a call centre, established and maintained. Without this call centre, telephone lines, radio frequencies, communications equipment and staff can be quickly overwhelmed.

Inter-Organizational Resource Management

A key function of an Emergency Operations Centre (EOC) is the assessment and coordination of the overall response in a disaster. It is essential for both public safety communicators and emergency planners to be aware of the possibilities of *over-response* to an individual or multi-site disaster. Using the Incident Command System (ICS) and establishing the EOC early in an event ensures that inter-organizational resource management will be addressed from a universal perspective. ICS is dependent however, on an effective *integrated* emergency plan that has been exercised and updated on a regular base. All levels of personnel, from first responders to EOC staff must be trained in ICS prior to an event. ICS is the most effective when all personnel are comfortable in its use, thus using the Incident Command System for all responses, no matter how small, will ensure staff is trained to use it when it counts the most, during a disaster response.

3. Response Phase

As agency responders start to deal with the emergency, the Incident Command System (ICS) is implemented and dependent on the needs of the Incident Commander on scene; the Emergency Operations Centre (EOC) may be activated. These organizational steps are essential in the coordination of planning, assessment, response and recovery needs when dealing with long term and/or large-scale events. This includes the replenishment of personnel and material resources as they become fatigued or consumed. This strategic planning also ensures the continuity of

government functions and the provision of necessary services during and after the emergency. When extraordinary powers are needed, the Declaration of a State of Local Emergency occurs during this phase.

4. Evacuation Phase

Every major emergency and disaster event has the potential of putting the public at risk. It may be necessary to evacuate the population in the area, and planning for them should occur long before the disaster happens. Reception centres need to be established and the provision of evacuee services assured. Evacuations often require the involvement of adjacent communities as either hosts to set up reception centres to receive evacuees from the impacted community, or to provide volunteers to assist in a reception centre of the community impacted. This necessitates the expansion of communications to cover and the additional workload when an evacuation occurs. It may be necessary for a Declaration of Local State of Emergency if a forced evacuation is warranted.

5. Recovery/Reconstruction Phase

The *recovery/reconstruction phase* is often the longest phase of a disaster. It is the closing phase of the emergency response effort. During this phase, the responders are demobilized, and the responsibility for operations is shifted to the *recovery unit* of the EOC where an Incident Commander may be appointed to oversee recovery operations at the site.

Recovery Units are responsible for short-term and long-term planning for the purpose of recovery. These mobilize resources for rebuilding, plus maintain government and agency operations. *Recovery Units* are also responsible for developing plans to garner financial assistance from varying levels of government and from insurance and relief agencies.

Implementation of special programs such as Employee Assistance Programs and Critical Incident Stress Debriefings can occur during this period.

6. Post Incident Review Phase

From a historical perspective, the *review phase* is the most important. No matter how thorough the emergency plans are, or how well trained the personnel are, some of the most poignant lessons are learned from hands-

on experiences. Activity in this period includes the review of evaluations of the response, and the resolutions of any conflicts that occurred during the operation. These reviews and assessments should celebrate the accomplishments of personnel in handling the emergency, and should identify areas needing improvement for future emergencies. It is important that all staff members contribute their experiences and viewpoints and participate in making recommendations, to increase commitment to resulting plans.

Inventory and assessment of equipment should also be done during this period, and appropriate recommendations made.

Gathering and Disseminating Information

Information, public and internal, is a common factor throughout all phases. It is gathered from all areas of the incident in order to accurately forecast the direction the event is taking. Information is also used to keep the executive levels and the public informed. The executive level is informed via briefings and situation reports, while the public is informed through call centres and the media.

Designated Information Officers (IO) are briefed by EOC staff, who in turn provide regular media briefings from the alert phase of an event to the recovery and review phase. The role of the IOs and the media is critical in the management of the public's awareness. The media should be considered as a partner in emergency management and as such should be included in the planning process. When the media is not included, there may be difficulties for the responders due to their persistence in getting information.

Chapter 9: Public Safety Communicators' Roles In An Emergency Or Disaster

Communication vs. Communications

There is a big difference, which is more than semantics.

- **Communication** is that *process* whereby people exchange ideas and information.
- **Communications** are the *means* by which we exchange these ideas and information with each other.

Competent public safety communicators need to be fully trained in the use of their communications equipment, and comfortable with it. When equipment fails, it is essential that agencies have backup communications systems, as an example, the Province of British Columbia has a network of amateur radio volunteers and equipment to back up the provinces day to day communications system.

Basics of Good Communication – Train/Exercise/Evaluate

The development of any emergency plans will include an *Emergency Communication Contingency Plan*. This plan must be a component of the overall Emergency Plan, not a stand-alone document, and all personnel must be familiar with its contents. This is accomplished by regularly scheduled training and exercises based on the content of the plan. This enables personnel to maintain a high standard of competency and facilitates the regular review of all equipment.

Inter-Agency Communications

It is paramount to have inter-agency communications during responses, especially during disaster events. In British Columbia, a number of first responding agencies and local jurisdictions have either the Fire Commissioner's tactical frequency or the Provincial Emergency Program's disaster frequencies programmed into their radios. However, it requires the individual to switch between channels to facilitate the inter-agency communication. While using the inter-agency channel, responders are unable to monitor their own agency's frequency. The Incident Command System resolves this dilemma with the development of an Emergency

Communications Contingency Plan that encompasses all disaster communications needs. This plan facilitates the necessary communications between emergency responders, the Incident Commander and the EOC, and the EOC to the PREOC etc.

Role of Public Safety Communicators

The onset of a major emergency results in the narrowing of the communicators' focus to those activities that support the response to the major emergency or disaster. Technology exists to ensure priority use of the telephone system so that key people can contact the communications centre. During major emergencies and disasters, there are a number of identifiable stressors, such as separation from family and friends, fatigue, equipment failure, changes in reporting structure, and interpersonal conflict. Communicators, who know that their families are personally prepared, are better able to cope. Further, those communicators who work well together on a daily basis are more likely to work well together under the higher stress conditions of a disaster. Those communicators who work in different centres on a temporary basis will be faced with the additional stress of working with less familiar co-workers and equipment.

Public safety communicators are a key focal point for incoming information from the field and the public, especially in the initial stages of an event. This information is paramount for the Emergency Operations Centre to support the site and forecast the event. Briefings ensure that all agency communicators are informed of the situation on a continuous basis as the disaster emerges. This is important in order to maintain a coordinated response. Briefings are also an essential component of the Incident Command System.

Agency Emergency Plans must contain a specific Communication Contingency Plan to guide the activity of the communications staff. Contingency plans are comprised of guidelines to refer to when there are problems with technology, or when key people or agencies are unable to be contacted for any reason. It is essential to note that contingency plans are guidelines for incidents. All personnel involved in the event need to be adaptable to the needs of the disaster. This makes the difference in mitigating the effects of a disaster. The degree of adaptability is dependent

on the knowledge and experience of the individual; therefore it is imperative that there are regularly scheduled training and exercises to foster this environment.

Resource Management

Two components of emergency management that will test the resource management skills of communicators are evacuations and Heavy Urban Search And Rescue (HUSAR). It is essential that in either of these cases that an EOC be established. The overall purpose of an EOC is to provide site support, jurisdictional resource management, policy direction, and jurisdictional event forecasting. Forecasting involves compiling a needs assessment, and is the focal point for a Declaration of a Local State of Emergency. In the event that the disaster exceeds the capability of EOC, the Provincial Regional Emergency Operations Centres (PREOC) will provide support to the EOC with both provincial and federal resources. Often, evacuations and HUSAR require more resources than the local jurisdiction has readily available, making the EOC link to the PREOC an invaluable one. This link can relieve some of the logistical pressure from communicators, allowing them to concentrate on providing direct support to the Incident Commander.

Evacuation

Evacuation is used to remove people, pets and livestock areas of risk to safety. Every major emergency or disaster event has the potential of forcing an evacuation. Whether the cause is related to dangerous goods or wild land urban interface fires, the needs of the evacuees remain the same:

- Registration of the evacuees,
- Food clothing and lodging
- Emotional support
- Family reunification

An evacuation is a complex procedure requiring the careful coordination of numerous agencies with distinct roles. The framework for this coordination is most effectively developed pre-disaster during the Emergency Planning process. In developing an evacuation plan, the specific geographic area

must be considered and the plan and must be developed in conjunction with response and support agencies, plus all three levels of government.

Shelter in Place

Under certain circumstances evacuating people due to toxic spills may put them directly in harm's way once they leave their homes or places of business. An example was a train derailment in the United States. A toxic cloud being released from a number of derailed tanker cars encompassed a residential area. The Incident Commander assessing the situation based on technical expertise, made the decision to shelter people in place.

Immediately, the broadcast media was contacted to inform people of the community those residents in the immediate area of the toxic cloud were to remain in their homes. The message included the seriousness of situation and precautions that the residents needed to take, including the necessity to shut all doors and windows, retreat to their basements, place towels under doors to prevent the fumes from entering the house, etc.

The authority for evacuations varies from province to province. In British Columbia there are six legislated authorities that can evoke powers to declare and enforce an evacuation:

1. Ministry of Public Safety & Solicitor General, Governor General, Municipalities and Regional Districts with By-laws – Emergency Program Act
2. Office of the Fire Commissioner, Ministry of Community, Aboriginal, and Women's Services – Fire Services Act
3. British Columbia Forest Service – Fire Protection Act
4. Ministry of Water Land and Air Protection – Environmental Protection Act
5. Ministry of Health – Health Act
6. The Oil and Gas Commission – Oil and Gas Commission Act, Petroleum and Natural Gas Act, Pipeline Act.

Contrary to popular belief, police in British Columbia cannot authorize evacuations. For the purposes of evacuations the police take the lead role in:

1. Enforcement of the order
2. Traffic Control
3. Security of the evacuated areas

Authorization

Authorization is a two-stage process:

1. determining the need for evacuation
2. authorizing the evacuation order

The necessity to evacuate is determined by the Incident Commander. Under the Emergency Program Act, authorization for evacuation is coordinated by the Emergency Operations Centre (EOC). If the danger is obvious, such as rising floodwaters or a wild land fire encroaching on an urban setting, the Incident Commander may determine that an evacuation or shelter in place is required. Most evacuations are voluntary, especially in the initial stages. People in the affected area are made aware of the hazard and the risk to themselves and their families. This is usually done door to door by first responders. An immediate determination is made by the IC that it is in the best interest of the public to evacuate their homes. While this process is being undertaken, the Incident Commander can advise the EOC that a Declaration of a Local State of Emergency is required. Most people will heed the first responder and will evacuate once they realize the threat they face by not leaving. The decision to authorize an evacuation order is based on a number of factors including:

- the nature of the disaster and the risk to the public,
- the type of hazard,
- potential secondary issues that may be exasperated by the hazard,
- weather conditions or those forecasted,
- barriers that could hinder an evacuation,
- potential duration of the incident,
- time available to carry out the evacuation,
- resources required to contain the situation,

- resources required to secure the area.

Notification

Notifications and means of notification are directly dependant on the urgency of the hazard. In the example of a HazMat incident with product being released into the atmosphere, time may allow first responders to quickly evacuate those at risk or to advise people to shelter in place. In this type of scenario, the first responders cannot wait for the official evacuation orders to come down through the system. Once the victims and responders are safely out of the area, a notification will go out to potential stakeholders. This includes municipal, provincial, federal, government organizations and the private sector (industry). Some events are slow in the onset and allow for time to plan. These types of events can become imminent events that are forecast over a period time. Examples may be a spring freshet flooding or some wild land urban interface fire threats as was the 1998 Silver Creek Fire in B.C. A lightning strike started a fire on Mount. Ida, southwest of Salmon Arm on the Friday. Forestry crews had the fire well under control through the weekend, until weather conditions changed on the following Monday. A low-pressure system brought heavy winds, which fanned the fire. By Tuesday the fire raged out of control, consuming hectare after hectare of forest, cutting a path directly toward the populated Salmon Valley and the city of Salmon Arm. The EOC spent the next 48 hours planning for the evacuation and preparing the residents for the inevitable evacuation order. As previously mentioned, not only was the Silver Creek Fire the largest peace time evacuation in the history of British Columbia, it went smoothly with no difficulties.

Once an evacuation order has been issued, notification and the carrying out of the order is the responsibility of the police. Special consideration needs to be undertaken for:

- people who do have difficulty communicating in English,
- invalids or shut ins,
- schools and school boards,
- hospitals and nursing homes,
- businesses,

- industries,
- jails.

Once the EOC has been established, coordinating notifications outside the perimeter of the incident site becomes the responsibility of the EOC.

Methods of Notification

Broadcast media is normally the quickest method of getting notification to a large population. In most cases the general public is in contact with either television or radio at some point throughout the day.

However, there are people who may not be listening to the media at all times. Therefore, other methods of notification should be implemented to ensure that all people within the affected area are notified. Other methods of notification include:

- Mobile public address systems,
- Door-to-door contact, using pre-printed information circulars, and,
- Telephone fan out - a community that has planned for an event under the Neighbourhood Preparedness Program will have a community directory and people assigned to facilitate notification fan-outs.

Contents of the Notification

Studies show that people are more likely to obey an evacuation order and be evacuated in an orderly manner if they are provided with as much information as possible about the incident.

An evacuation notification should include:

- the nature of the incident,
- evacuation routes,
- reception centre locations
- the services available
- temporary shelter locations,
- transportation needs

- what to bring (photos, identification, cash, medicine, prescriptions, clothing, sleeping bags).
- Broadcast media to monitor for updates
- Telephone numbers of Information Call Centres

There is still no replacement for personal preparedness to mitigate the stress that is normally experienced by evacuees.

Confirmation

People usually seek confirmation of an Evacuation Order to evacuate.

People are quite often skeptical of the first Evacuation Order to evacuate. A recent study showed that, 80 percent of people tried to confirm the first warning through an additional source of information. This can inundate emergency communicators with calls for information. It can and often does lead to the telephone system being overloaded and shutting down. When the evacuation order was issued in Salmon Arm in 1998, the telephone system in Salmon Arm went completely down for 3 hours. No one could call out of the City and no one could call in. The relevance of this is that there was a 48-hour time frame to plan for the evacuation that included a public awareness campaign to not use the telephones unless it was an emergency.

The importance of confirming notification must not be underestimated. More than one method of notification should be used to ensure that everyone receives an initial notification, and that those who seek confirmation, receive it. Whenever possible a written facts sheet should be handed out to all evacuees.

Traffic Control

Next to notification, the safe and efficient movement of people to a place of safety is the most important evacuation function. The Incident Commander in conjunction with the police must establish egress and ingress routes to ensure a coordinated movement of emergency equipment and personnel entering and leaving the site, as well as the timely and smooth evacuation of civilians leaving the site. The keys to effective traffic control are pre-planning and exceptional communication.

Traffic control can be broken down into four main steps:

- departing schedule,
- egress and ingress routes,
- inside and outside perimeter control, and
- flow control

Securing Property

Whenever an area is evacuated, it is left virtually unprotected and susceptible to crime. Although looting is not as common as many people would think, it does occur. Therefore, police take measures to secure the area.

Search and Rescue (SAR)

In areas where policing resources are minimal, the police can garner assistance from volunteer SAR teams. These volunteers can assist the police in notifying the public, traffic control and security. SAR teams arrive on scene easily identifiable; they are equipped with their own communications network, and in most cases are fully self-contained.

As people become involved in outdoor activities, more are exposed to the hazards of the outdoors. People who are lost, trapped or injured are the often subject of search and rescue operations. The search operation can extend over several weeks, cost thousands of dollars, and endanger the lives of searchers. Search and Rescue in British Columbia is a highly organized, integrated structure. This means that depending on the search requirements; any SAR team in British Columbia can be deployed anywhere in the province. Search and rescue operations are divided into four categories:

1. air
2. marine
3. land and inland waters
4. heavy urban search & rescue

Air

Air search and rescue operations are the responsibility of the Department of National Defense (DND) and in British Columbia are coordinated through the DND's Rescue Coordination Centre in Victoria. A volunteer organization exists to assist the DND in their Air Search & Rescue operations, called the Canadian Air Search and Rescue Association (CASARA). In British Columbia CASARA volunteers are covered through the Provincial Emergency Program for WCB claims. This coverage is offered through a EMBC volunteer organization called PEP Air.

While CASARA/PEP Air's primary responsibility is to DND for missing aircraft, they are also used by EMBC to support ground search and rescue operations and for moving personnel and equipment throughout the province in support of disaster responses.

Marine

Marine search and rescue operations in British Columbia are the responsibility of the Canadian Coast Guard and are also coordinated through the DND's Rescue Coordination Centre in Victoria.

Coast Guard is available to support EMBC SAR operations by moving volunteer SAR groups between the coastal islands and by providing shoreline searches from the water. They can support emergency management by moving personnel, supplies and equipment throughout the coastal region.

Police and Harbour marine patrols provide support and assistance to air and marine search and rescue operations to the lead agencies when requested.

Land and Inland Waters

Land and inland water search and rescue operations are the responsibility of the local police. The Provincial Emergency Program provides support to the police in British Columbia via the volunteer Search and Rescue teams. The Incident Command System is the management system used in British Columbia for searches. The police maintain the Incident Commander role for all searches and the EMBC trained SAR manager is their Deputy Incident Commander. Logistical support to searches is provided through the EMBC regional offices.

Inland waters include:

- canals
- lakes
- rivers
- inlets

Heavy Urban Search and Rescue (HUSAR)

Urban Search and Rescue (USAR) is the capacity to rescue victims from major structural collapse or other entrapments. It can range from lightly equipped teams to self-contained, fully mobile Heavy USAR teams.

Heavy USAR

- Locating people trapped in collapsed structures using search dogs and sophisticated electronic equipment
- Breaking through or shoring up structural components such as walls
- Removing debris using heavy equipment such as cranes
- Extricating and treating victims

With PSEPC's leadership and guidance, the cities of Vancouver, Calgary, Toronto and Halifax, as well as the province of Manitoba have developed Heavy USAR teams intended to deploy, when needed, anywhere in Canada. PSEPC also supports a complementary range of local capacities for Light and Medium USAR, currently in 41 other urban centres across the country.

Funding of \$20 million over six years and \$3 million ongoing was allocated in the December 2001 Federal Budget to develop a national Heavy USAR capability to address all hazards. The cost of USAR development is shared with provinces and territories through the Joint Emergency Preparedness Program (JEPP). This highly skilled team, trained in conducting search and recovery operations in and around collapsed structures was mobilized after the October 1989 earthquakes in Northern California collapsed the Oakland Bridge Freeway. More recently they were brought in from around North America to assist in the World Trade Centre

Terrorist Attacks in September 2001 and in the aftermath of Hurricane Katrina. Because HUSAR teams travel into areas that have been devastated by the disaster, they come fully self-contained so they do not add extra burden to the local agencies. The City of Vancouver has a trained HUSAR team made up of fire fighters, paramedics, doctors and managers. The Vancouver team can be deployed anywhere in the world at the request of the Public Safety and Emergency Preparedness Canada through the Provincial Emergency Program.

Mobilization of SAR

In British Columbia, the Emergency Management BC (EMBC) coordinates more than 4,500 community-based volunteers who are organized into local search and rescue groups throughout the province. The local search and rescue groups are available to provide assistance to police. Each group has a search and rescue manager. There are several roles within search and rescue, namely:

- Detachment Commander – this police officer has the overall responsibility for search and rescue operations that occur within their particular municipality or geographical area.
- The Detachment Commander – assigns or assumes the Incident Commander role for each search and rescue operation. This Incident Commander is normally the first investigating officer.
- Family Liaison Officer – is maintained by the police and is responsible for liaising with relatives of the missing person(s).
- Search and Rescue Manager – is a member of a volunteer search and rescue group and is responsible for liaison with the Incident Commander on Operational requirements.
- EMBC Regional Manager – maintains responsibility for authorizing or receiving authorization for extraordinary support to a search. In large searches the Regional Manager can fill the function of Logistics Section Chief.
- Local Authority Emergency Coordinator – can act as a liaison between the search and rescue manager, the municipal government and provincial ministries (including EMBC).

Standards for search and rescue are developed by the SAR Branch of the Emergency Management Division of the Justice Institute of British Columbia (JIBC) under contract to the Provincial Emergency Program. The JIBC is responsible to both drafting standards for acceptance by EMBC and to provide training for ground Search and Rescue volunteers. EMBC also has a staff Search and Rescue Specialist based out of EMBC headquarters in Victoria. The SAR Specialist works with both the volunteer SAR advisory Committee and the JIBC SAR Coordinator to develop standards and protocols for Search and Rescue in British Columbia. The SAR Specialist also acts in an advisory role to the EMBC regional managers on SAR issues and will attend large searches to support the SAR needs.

Communications Officers

A number of specialized procedures, roles and documentations are utilized by communications officers within the Public Safety Services during emergencies and disasters. They can include the following:

Emergency Fan-out/Call-out Lists

- List all personnel and their contact phone numbers and addresses.
- Prioritize personnel via duty, rank or specialization.
- Should be readily available to public safety communications staff.
- Resource inventory.

Tsunami Warning Procedures

(Source: BC Tsunami Warning and Alerting Plan, Chapter 2- sub section 2.1 – Procedure for Dissemination of Tsunami Warning Information for British Columbia)

The overall responsibility for the initiation of tsunami warning information for British Columbia rests with the West Coast/Alaska Tsunami Warning Centre (WC/ATWC) situated in Palmer, Alaska.

Tsunami warning information is formally disseminated to only one agency per country, territory, or administrative area. British Columbia receives

warning information from WC/ATWC through the Provincial Emergency Program.

Because the methods of dissemination are used in the interest of speed of transmission, many other agencies and individuals may “eavesdrop” on messages from WC/ATWC, or from the Pacific Tsunami Warning Centre in Hawaii (PTWC). Formal warning and alerting for the province, however, (including ships and float planes) is the responsibility of EMBC.

The complete Tsunami Warning and Alerting Plan can be reviewed on the EMBC web page: <http://embc.gov.bc.ca>

Explosives Unit Procedures

- Activate team call-out list
- Include resources list
- Specialized telecommunications procedures
- Liaison with requesting agency
- Investigation and termination of incident procedures

Emergency Response Team (ERT) Operations

ERT is an RCMP specialized unit used in dealing with hostage incidents and armed standoffs.

- May provide Incident Command Post Specialized Public Safety Communicator function
- Activate team call-out list
- Specialized telecommunications procedures and equipment
- Integration with regular departmental operations
- Integration with other agency operations
- Security and safety procedures

Hostage Taking Procedures

- Restricted radio

Explosives Team Operating Procedures

- Restricted radio use.

VIP Security Procedures

- Restricted radio

Hazardous Materials Incidents

- Report spills to the Provincial Emergency Program's Emergency Coordination Centre in Victoria
- Activate call-out lists
- Activate resource lists
- Liaison with CANUTEC or other agency specializing in hazmat (hazardous material) response
- May include evacuation procedures
- Liaison with MELP (Ministry of Environment, Lands and Parks) and Fire Commissioner's Office
- Activate specialized crews, shifts and environment

Multiple Casualty Incidents

- Activate call-out lists
- Support triage of patients at scene
- Triage of requests for aid by public during incident (regular calls)
- Mutual aid activation
- Liaison with other responding agencies and hospitals
- Cataloguing of patient dispositions

Incident Dispatch Teams (IDTs)

In a major emergency, the Incident Commander can be overwhelmed with information and cannot adequately deal with all aspects of the command as well as communications.

Specially trained communicators are sent out to the Incident Command Post to operate the communication network for the emergency responders, and act as the conduit between the Incident Commander and the EOC. The IDT shifts the responsibility for emergency site communications from the

individual agency communication centres. The unique multi-tasking skills of competent public safety communicators make them ideal for IDTs.

Chapter 10: Administration Issues

To enhance communication and understanding, provincial government emergency response organizations, plans, procedures, and terminology have to be standardized.

The British Columbia Emergency Response Management System (BCERMS)

The Incident Command System (ICS) is an internationally recognized emergency management system, originating with the US Forest Service in the mid 1970's. Some provinces within Canada have adopted the principles of ICS. This provides a systematic way to manage policies, personnel, procedures and equipment directly at the site level. Utilized for small or large incidents, it can be scaled to accommodate the changing environment of a disaster. ICS recognizes the need to control the supervisor/worker ratio. Referred to as *span of control*, it can be easily scaled up or down depending on the hazard and the resources required to manage it. It is adaptable for multi-agency and multi-jurisdictional responses. The two command structures that can be used for Incident Command are:

- ***Single Command Structure***: as the first responding agency arrives on scene they assume the Incident Commander role in order to take control of scene. The Incident Command can be transferred to another agency holding jurisdiction or to a pre-designated Incident Commander. The Incident Commander is responsible for all responders and agencies arriving on scene according to the ICS organizational structure.
- ***Unified Command Structure***: during some responses there is a question of jurisdictional and/or geographic responsibilities by different agencies. In these cases, agencies can assign a representative to the Unified Command Group. This ensures that all agencies' concerns are met at the Incident Command level; however, the Unified Command Group (UCG) must appoint a single spokesperson amongst them to report on behalf of the UCG.

British Columbia uses the principles of the Incident Command System, integrating these principles into the BCERMS, (British Columbia Emergency Management System). BCERMS has been adopted by this province, and it must be used by all provincial ministries, crown corporations and provincial government agencies when responding to emergencies and disasters in the province. BCERMS is the recommended emergency management system for the federal government, municipalities, regional districts, first nations and private sector industry in British Columbia.

(The following is based on the British Columbia Emergency Response Management System, Overview February 2001).

Site Support

When the site level response exceeds the capabilities of the responders at the site, off-site support is required. The Emergency Operations Centre (EOC) is a facility away from the site that is established to provide support to the Incident Commander. The EOC's responsibilities include:

- Providing communication with the site level,
- Providing policy guidance,
- Managing the local multi-agency support to the site,
- Acquiring and deploying additional resources obtained locally, from other EOCs or from the Provincial Regional Emergency Operations Centre,
- The EOC also manages other jurisdictional function not impacted by the incident.

Provincial Regional Support

A Provincial Regional Emergency Operations Centre (PREOC) exists in each EMBC region. The PREOC reports directly to the PECC (Provincial Emergency Coordination Centre). In most circumstances, policy direction from the PECC is done through Policy Directives. The primary function of these PREOCs is to provide support to the local authorities. Other responsibilities include:

- Coordinate multi-ministry/agency support to local authorities,

- Where the need for a declaration of emergency extends beyond a local authority's jurisdiction or involves multi-jurisdictions, the PREOC processes a request for a Declaration of Provincial State of Emergency, specific to geographical area.
- Where an event impacts multiple jurisdictions, the PREOC prioritizes the deployment of resources in accordance with the BCERMS Objectives.
- Where no local authority exists, the PREOC directly manages the response activities.
- Whenever the PREOC requires additional resources not readily available the PECC is called for the support.

Province Wide Support

For the province of British Columbia, the Provincial Emergency Coordination Centre (PECC) is located in EMBC Headquarters in Victoria. The PECC's primary responsibility is to provide support to the PREOCs. PECC's responsibilities include:

- Managing the overall provincial government response, particularly in the event of simultaneous multi-region disasters, such as earthquakes, floods or wild urban interface fire threats,
- Ensuring adequate province wide mobilization and allocation of provincial assets,
- Implementing the British Columbia Emergency Public Information Plan,
- Managing the acquisition of federal disaster support structure from National Defense and Office of Critical Infrastructure Protection and Preparedness.

Provincial Policy Direction

The Central Coordination Group (CCG) is responsible for providing policy direction to both the PECC and the PREOCs. The CCG is made up of the Director of EMBC as co-chair, the director of the key ministry as the other co-chair and the director of the key support

ministry. The PECC is the executive arm of the CCG and is responsible for communicating policy direction to the PREOCs.

Committee of Cabinet

In the event of a major disaster, the Minister and the Solicitor General may establish an ad hoc committee of cabinet to provide government direction to the CCG.

BCERMS Objectives (in order of priority)

- Provide for the safety and health of all responders,
- Save lives,
- Reduce suffering,
- Protect public health,
- Protect government infrastructure,
- Protect property,
- Protect the environment,
- Reduce economic and social losses.

Emergency Operations Centre (EOC)

Structure

Although the use of BCERMS is mandatory for provincial government ministries, crown corporations and agencies, its use is optional for the federal, regional district and municipal governments. It is strongly recommended that federal government agencies and all municipalities and regional districts in British Columbia adopt BCERMS.

The BCERMS structure is based on the five Incident Command Functions: Command (management), Operations, Planning, Logistics and Finance/Administration. A significant advantage of adopting BCERMS is the mitigation of the number one common global problem during responses, *communication*. This means much more than sharing common terminology in a response. BCERMS encompasses the concept of operations, the operations

centre structure, and emergency management forms. This facilitates consistency through all levels of response and support structures.

Local authorities can establish a *Policy Group*, once the EOC has been established. The *Policy Group* will include the Mayor and council (for regional districts Board Chair and Board Members) and may include senior executive officers. This group provides policy direction to the EOC Director. For example, the *Policy Group* gives authorization for a Declaration of State of Local Emergency, with the mayor or designate sitting as the chair of the *Policy group*. The EOC Director is responsible to keep the *Policy Group* briefed on all issues surrounding the event.

Activation

Activation of an EOC varies, depending on the event. The Incident Commander (IC) on scene is the official who requests the activation of the EOC. The IC normally upon arrival on scene, recognizing the need for extraordinary resources or an anticipated need in order to mitigate the effects of the event, or if the event is of such a nature that an evacuation is required, or the potential for evacuation is present. In addition, if the event is multi-jurisdictional and/or multi-agency, it also may require EOC policy direction and coordination.

For detailed information on BCERMS students are encouraged to review:

- Introduction into Emergency Management in British Columbia, produced for the Provincial Emergency Program by the Justice Institute of British Columbia, 2002
- EOC Operational Guidelines, Provincial Emergency Program, 2001
- British Columbia Emergency Management System (BCERMS) PREOC Operational Guidelines (Interim) 2001

All these documents and much more is available on the EMBC web page: <http://www.pep.bc.ca>

Chapter 11: Emergency Planning Process

Developing an Emergency Plan

Emergency plan may be developed by a number of methods that differ primarily in how the activity is organized and named. The process presented here is a generic model that includes basic elements.

Establish Need and Obtain Support

Establishing need and obtaining support is essential in that it convinces key stakeholders of the need to develop a plan, and elicits their support and cooperation in its development.

Perform Risk/Hazard Assessment

Performing a risk/hazard assessment provides ideas about the types and severity of the emergencies that can be anticipated.

Assign Responsibilities

The determination of risk leads to an understanding of the possible responses that may be required. Specific agencies are assigned the responsibilities for particular functions. Each agency then assesses existing resources and provides appropriate assistance.

Detailed Planning

The *detailed planning process* results in specific detailed plans for utilization of resources and relationships in response to various scenarios.

Training and Exercise

All participants need to understand the overall plan and their individual roles in the plan, so they can respond appropriately. Training exercises are essential to allow those involved to gain the required knowledge, and to assess the adequacy of the plan and preparation for real emergencies. Five types of exercises may be used:

1. ***Orientation Seminar*** – The orientation seminar is used to introduce or refresh participants to plans and procedures, by lecture, panel discussion, media presentations, or talk through. All levels of personnel (policy, coordination, operations, and field) are involved.

2. **Drill** – The drill tests a single emergency response function. It involves actual field response. Its effectiveness lies in focusing on a single, or relatively limited, portion of the overall response system in order to evaluate and improve it.
3. **Tabletop Exercise** – In a tabletop exercise, actions and discussions are based on a described emergency situation *plus* a series of messages to participants. Participants practice problem solving for emergency situations through on-going discussions and critiques of the appropriateness of actions taken and decisions made. Participants also practice coordinated and effective response. The tabletop exercise permits breaks before new messages are delivered to discuss proper response. It involves policy and/or coordination personnel.
4. **Functional Exercise** – The functional exercise is a simulation of an emergency that includes a description of the situation, a timed sequence of messages, and communication between players and a simulation group. For example, EOC members could practice coordinated, effective response in a time-pressured, realistic emergency situation. Individual and system performance is evaluated. It involves policy and coordination personnel.
5. **Full-Scale Exercise** – The full-scale exercise adds a field component to interact with a functional exercise through actual and simulated messages. It tests the deployment of seldom-used resources and involves policy, coordination, operations and field personnel.

Revision of the Plans

The overall plan and its component parts must be kept current through updating and exercise.

Emergency Planning Weaknesses

A considerable number of things can go wrong in a major emergency. While the data below is for all personnel involved in handling a major emergency, most can be applied to public safety communicators.

Top Ten Weaknesses in Emergency Planning*

1. No systematic collection of information
2. No systematic dissemination of information
3. No provision for establishing on-scene command/management

4. Not able to achieve inter-organizational coordination
5. Specific responsibilities are not described
6. Incomplete hazard assessment and analysis
7. The plan is not exercised
8. No provision for updating and revising the plan
9. No consideration for the users of the plan
10. Plan is not distributed to involved agencies

**Note: All of these weaknesses are related to communication*

The Human Element Issues

Many of the problems are *people-related* rather than *equipment-related*.

They include:

- Stress
- Fatigue from workload and stress
- Staff health issues become amplified due to stress
- Job profile expands and expectations are increased beyond routine
- Personnel are not necessarily capable of dealing with the pressures of major emergencies
- Operator lacks knowledge of the specialized procedures
- Inadequate planning for operational periods and shift relief

Administration Level Issues

- Non unified terminology and procedures
- Lack of confidence
- No agreement on information sharing
- Concern about loss of agency autonomy
- *Robinson Crusoe Syndrome* (we are in this by ourselves)
 - autonomy vs. sharing

– priority given to own agency rather than overall response effort

Chapter 12: Emergency Communications Plan

Part of the emergency planning process is the development of the *emergency communications plan*. This document defines the communications segment of the overall *emergency management plan* and embraces Command Control and Communications. All those affected by the plan should be involved in its development.

An emergency communications plan must:

- set priorities,
- establish protocol,
- decrease stress through preparation.

Its components include:

- the identification of personnel in charge within the organizational structure,
- the allocation of communication resources,
- personnel and agency, directory
- the procedures for those communications necessary in deploying resources to the impacted areas and the day-to-day operational call outs.

Components of an Emergency Communications Plan

1. Brief Introduction/Background

2. Communication Centre Responsibilities

- Define roles of all communication Centre staff
- Define emergency roles for specialized/designated staff
- Define who is responsible for activation of the plan
- Describe how the activation will occur
- Describe emergency back-up systems for the plan

3. Plan Activation Procedures

- Describe who can activate the plan

- Describe how activation will occur
- Describe back-up systems for the activation procedure

4. Fan-out List(s)

- It is crucial that contact be made with staff ASAP to avoid *convergence*.
- Try to group calls to same exchanges
- Have a back-up system in place in the event of telephone system failure

5. Communications Matrices

- There should be separate matrices for departmental and inter-agency communications
- Identify all critical and non-critical links
- Identify contingency systems and cross-reference to resource lists
- Group links that are *alike*
- Should be designed within an organizational chart (BCERMS structure preferably), which includes the agency communication centre as the communication focal point for dispatching information.

6. Resources Lists

- Include communications links with all non-emergency organizations used on an infrequent or special occasion basis
- Include equipment index/procurement record
- Include capabilities and *limitations* of each resource organization
- Cross-referenced for organization name and resources/equipment they possess

7. Personnel Utilization

- Designate levels of response associated with size of call-out of personnel

- Pre-plan a personnel check-in procedure (BCERMS)
- Identify the need for shift management during extended work periods based on the event
- Identify extraordinary procedures for conscription or volunteers

8. Incident Demobilization (BCERMS)

- Designate authority who may demobilize
- Outline demobilization procedures

Chapter 13: Contingency Planning

Contingency planning can be defined as a set of procedures employed when operations equipment is disabled by unscheduled means.

Planning to maintain communication centre functions during a major emergency or disaster is critical because information flow is crucial, and the likelihood of disruption of communications function is greater when a major emergency is taking place. The main areas of concern include the failure or diminished capacity of: the electrical power system, the telephone system, the radio system, and the logging of activity.

Developing a *contingency plan* starts with the assessment of centre functions and their prioritization. What follows is an elaborate process of tracking ‘what if’ scenarios. The latter enables some tentative decisions to be made about how to maintain functions, and how capable the backup systems are of ensuring minimum operations.

This forecasting process often employs professionals from outside the agency. Inadequacies in the agency’s contingent capability can then be dealt with through the reorganization or the acquisition of additional equipment.

Power System Considerations

Power is required for equipment, lighting and, seasonally, heating. Analysis needs to be done to ensure that power is directed to the most vital equipment. Electrical utility backup can utilize uninterruptible power supplies (UPS), standby generators, and batteries.

Phone System Considerations

Industry Canada, Emergency Telecommunications Branch, in cooperation with federal agencies, provincial and territorial emergency measures organizations, and the telephone companies have developed a new technique for managing Priority Access for Dialing (PAD) data. This was formerly known as Line Load Control (LLC).

This initiative uses Internet technologies to manage the collection of PAD data at all three levels of government. Agencies are provided access to their PAD data using common internet browsing tools. Entry and update of

records is possible through a simple user interface using widely available browsers. Telephone company access, in turn, permits the download of records for installation on central office switches.

This ensures that the increase in personal phone calls will not tie up the system and prevent emergency traffic.

There are number of options in an emergency in addition to regular phone service, such as Analog Cellular, Digital Cellular and Satellite Phone Systems. Wireless telecommunication services are increasingly vital to the ability to coordinate and respond to crises.

Wireless Priority Service (WPS) is an enhancement to basic mobile service that allows Public Safety and Emergency Preparedness (PSEP) calls to queue for the next available service channel while minimizing impact on consumer access to the same wireless infrastructure. WPS will not, however, preempt a call in progress, nor will it guarantee the completion of priority calls.

WPS is not intended for use by all emergency personnel. It is only authorized for key PSEP leadership positions. Eligible users are key Federal, Provincial, Territorial and Municipal government and critical industry personnel who have PSEP or continuity of government responsibilities. There are five levels of priority for this service:

- Priority Level 1 – Executive Leadership and Decision Makers
- Priority Level 2 – Disaster Response/Military Command and Control
- Priority Level 3 – Public Health and Safety and Law Enforcement Command
- Priority Level 4 – Public Service/Utilities and Public Welfare
- Priority Level 5 – Disaster Recovery

Note: Amateur Radio may be utilized in some situations for communication normally to be carried out via telephone.

Analog Cellular

Advantages	Disadvantages
<ul style="list-style-type: none"> • Highly mobile • Point-to-point • Adaptable to the situation 	<ul style="list-style-type: none"> • Finite life-span of battery • Restricted network access • Largely dependent on land-line system

Digital Cellular

Advantages	Disadvantages
<ul style="list-style-type: none"> • Highly mobile • Point-to-point • Adaptable to the situation • Integration of Pager, Fax and Email 	<ul style="list-style-type: none"> • Finite life-span of battery • Restricted network access • Largely dependent on land-line system

Satellite Systems – Telesat, MSAT (1995)

Advantages	Disadvantages
<ul style="list-style-type: none"> • Does not rely on land-lines for system to system calls • Excellent for widespread coverage • Mobile, adaptable and lightweight 	<p>Expensive</p>

Radio Contingency Considerations

Alternate system capability and alternate frequency capability are required. The system needs to be both Intra-organizational and Inter-compatible. Regional frequencies are desirable; this function may be covered by Amateur Radio Systems staffed by volunteers.

Amateur Radio (Ham Radio)

The *Amateur Radio Service (ARS)* is an emergency radio communications service staffed by amateur radio volunteers in the service of the public. The ARS has been recognized by the Province of British Columbia as an emergency communications provider.

Advantages	Disadvantages
<ul style="list-style-type: none"> • First response • Ability to communicate regionally, nationally and internationally • Personal Communications -assist public in reunification, etc. • Communicate on behalf of agencies 	<ul style="list-style-type: none"> • They are volunteers • Training and capability vary

Radio Contingency Situations

- Power failure – no standby power – all back-up systems fail
- Radio system failure – everything else okay
- Computer terminal failure – radio system okay
- LAN/WAN equipment failure
- Specialized equipment failure
- Facility evacuation/destruction

Database/Computer Aided Dispatch Systems Considerations

Current trends toward increased use of CAD systems in the public safety field have created a whole new series of potential failure situations. The sophistication of the computers used in a communications centre determines to some degree the vulnerability of the operation, should the computer system be lost.

The use of UPS systems will provide some security, but staff must be aware that paper and pencil systems may need to be used for all logging functions. Forms and systems should be familiar and available to public safety communication staff.

Our dependence upon computer systems to maintain data and records is in itself a contingency plan; however, computers crash.

Database/Computer Contingency Planning

The basic elements and issues that need to be covered include:

- Off-site data backup
- Data tape back-up
- Records rotation
- Portable computers and network access
- Mobile FAX and Internet access
- Wireless/radio networks
- Software compatibility
- Hardware compatibility
- Security measures and system access
- Storage facilities
- Expansion capability
- Service agreement and restoration
- Staff maintenance training

Contingency Situations for Database/Computer

The following are possible situations that will have to be dealt with:

- Complete failure – no back-up system
- Complete failure – back-up fails
- Partial failure – UPS fails – standby power available
- Partial failure – UPS okay – standby power fails
- System crashes – all data lost – no off-site back-up

- System crashes – all data lost – off-site records available
- System error – software failure
- System error – virus introduced to system

Summary

Exercises test emergency plans in realistic scenarios, short of actual events. Reviewing these exercises gives information to address inadequacies identified in the exercise. These exercises also assist planners to identify the critical systems requiring contingency plans. This ensures continuity of delivery of services during actual emergencies or disasters.

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Glossary

This glossary does not contain terms or definitions related to specific resources for particular application areas. Users should supplement this glossary with agency-specific terms and definitions as appropriate.

Agency	An agency is a division of government with a specific function, or a non-governmental organization (e.g., private contractor, business) that offers a particular kind of assistance. In Incident Command Systems (ICS), agencies are defined as jurisdictional (having statutory responsibility for incident mitigation) or assisting and/or cooperating (providing resources and/or assistance). Examples are: police, ambulance, fire, emergency social services, the Red Cross, the Salvation Army.
Agency Autonomy	Within the Incident Command System, agency autonomy is protected by a number of procedures to ensure that a single agency maintains the working capability to function without threat of larger, more powerful agencies usurping resources and infringing on agency jurisdiction.
Agency Dispatch	The agency or jurisdictional facility from which resources are allocated to incidents.
Allocated Resources	Resources dispatched to an incident.
Apathy	Lack of interest or desire.
Area Command	An organization established to: 1) oversee the management of multiple incidents that are each being handled by an Incident Command System organization; or 2) to oversee the management of a very large incident that has multiple Incident Management Teams assigned to it. Area Command has the responsibility to set overall strategy and priorities, allocate critical resources based on priorities, ensure that incidents are properly managed, and ensure that objectives are met and strategies followed.
Assigned Resources	Resources checked in and assigned work tasks on an incident.
Assignments	Tasks given to resources to perform within a given operational period, based upon tactical objectives in the Incident Action Plan.

Assisting Agency	An agency directly contributing tactical or service resources to another agency.
Available Resources	Incident-based resources ready for deployment.
Band (radio)	Radio communication occurs on a number of different conduits named bands. A radio band is a group of identifiers called frequencies. It is possible for individual radios to have the capability to switch to a different frequency on the same band. For example, airline pilots may speak to air traffic control and their airline by switching frequencies. Also, several response agencies may speak to each other if they are operating on the same band by switching to the same pre-designated frequency.
Branch	The organizational level having functional or geographic responsibility for major parts of incident operations. The Branch level is organizationally between Section and Division/Group in the Operations Section, and between Section and Units in the Logistics Section. Branches are identified by the use of Roman numerals or by functional name, such as medical, security, and others.
British Columbia Emergency Management System (BCERMS)	A comprehensive emergency management system based on the Incident Command System, adopted by the government of British Columbia as mandatory use for all provincial government ministries, crown corporations and agencies for all response activities.
Cache	A predetermined complement of tools, equipment, and/or supplies stored in a designated location, available for incident use.
Central Coordination Group (CCG)	Located in Victoria responsible for providing policy direction to the PECC and the PREOCs. Also responsible to key the minister briefed on issues related to the event.
Chain of Command	A series of management positions in order of authority.
Chief	The ICS title for individuals responsible for command of functional sections: Operations, Planning, Logistics, and Finance/Administration.
Central Coordination Group	Located in Victoria responsible for providing policy direction to the PECC and the PREOCs. Also responsible to key the minister briefed on issues related to the event.

Clear Text	The use of plain English in radio communications transmissions. No Ten Codes or agency-specific codes are used when utilizing Clear Text.
Command	The act of directing and/or controlling resources by virtue of explicit legal, agency, or delegated authority. May also refer to the Incident Commander.
Command Staff	The Command Staff consists of the Information Officer, Safety Officer, and Liaison Officer. They report directly to the Incident Commander. They may have an assistant or assistants, as needed.
Communications Unit	An organizational unit in the Logistics Section responsible for providing communication services at an incident. A Communications Unit may also be a facility, such as a trailer or mobile van, used to provide the major part of an Incident Communications Centre.
Compensation Unit / Claims Unit	Functional unit within the Finance/Administration Section responsible for financial concerns resulting from property damage, injuries, or fatalities at the incident.
Complex	Two or more individual incidents located in the same general area, which are assigned to a single Incident Commander or to Unified Command.
Convergence	Crowding or dense gathering of persons, vehicles, or incoming calls, which compromises the ability to respond in an orderly fashion. Also, the appropriate and desirable coming together and alignment of plans in various regions and areas.
Cooperating Agency	An agency supplying assistance other than direct tactical or support functions or resources to the incident control effort, such as Red Cross, telephone company, and others.

Coordination	The process of systematically analyzing a situation, developing relevant information, and informing appropriate command authority of viable alternatives for selection of the most effective combination of available resources to meet specific objectives. The coordination process (which can be either intra- or inter-agency) does not involve dispatch actions. However, personnel responsible for coordination may perform command or dispatch functions within the limits established by specific agency delegations, procedures, legal authority, etc.
Coordination Centre	Term used to describe any facility used for the coordination of agency or jurisdictional resources in support of one or more incidents.
Delegation of Authority	A statement provided to the Incident Commander by the Agency Executive delegating authority and assigning responsibility. The Delegation of Authority can include objectives, priorities, expectations, constraints, and other considerations or guidelines as needed. Many agencies require written Delegation of Authority to be given to Incident Commanders prior to their assuming command on larger incidents.
Dispatch	The implementation of a command decision to move a resource or resources from one place to another.
Dispatch Centre	A facility from which resources are assigned to an incident.
Division of Labour	In normal situations, the labour is divided and conducted as required in daily operations. For example, police have their routine areas to patrol, defined duties to fulfill, and familiar responsibilities. However, when a major incident or event occurs, the division of labour changes. The police may then need to concentrate on an area not familiar in their daily routine, may perform other non-specialized forms of police work, and priorities would be altered.

Effective Span-of-Control	In modern management practice supervisory positions are designed to accommodate several different tasks, with the usual ratio being 5 to 1. In extraordinary circumstances, this ratio may vary. In the Incident Command System, if assigned tasks and communications are easily managed during an incident, the effective span-of-control may increase up to eight tasks. However, in a large and increasingly complex incident, the opposite may be true in that the supervisor may then oversee only one or two tasks.
Emergency Incident	A situation as defined by the Emergency Program Act, the Environment Management Act and other provincial acts and regulations which requires saving lives, reducing suffering, protecting property and the environment, and mitigating economic and social losses.
Emergency Operations Centre (EOC)	A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response to and support for an emergency response.
Emergency Operations Plan	The plan that each jurisdiction maintains for responding to hazards.
Emergency Plan	A plan of preparation for coordinated response action to protect the health, safety or welfare of people, to limit the damage to property, and for recovery from emergencies and disasters.
Emergency Program Coordinator	The individual within a local authority who has coordination responsibility for jurisdictional emergency management.
Emergent Event	Unfolding over a period of time: disasters are emergent A planned, non-emergency activity. ICS can be used as the management system for a wide range of events, such as parades, concerts, or sporting events.
Function	In Incident Command System, function refers to the five major activities: Command, Operations, Planning, Logistics, and Finance/Administration. The term <i>function</i> is also used to describe the activity involved, e.g., the planning function.

Functional clarity	ICS divisions are organized in a manner that facilitates focus on the principle task at hand. For example, the Operations Section would not be concerned with financial or sheltering issues. The Financial/Administration Section and the Logistics Section, respectively, are proactive in remedying these concerns.
Generic ICS	Refers to the description of ICS that is generally applicable to any kind of incident or event.
Incident	An occurrence, either human caused or by natural phenomena, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.
Incident Action Plan	Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of forms as attachments (e.g., traffic plan, safety plan, communications plan, map, etc.).
Incident Command Post (ICP)	The location at which the primary command functions are executed. The ICP may be collocated with the incident base or other incident facilities.
Incident Command System (ICS)	A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.
Incident Commander	The individual responsible for the management of all incident operations at the incident site.
Incident Management Team	The Incident Commander and appropriate Command and General Staff personnel assigned to an incident.
Incident Objectives	Statements of guidance and direction necessary for the selection of appropriate strategy(s), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed. Incident objectives must be achievable and measurable, yet flexible enough to allow for strategic and tactical alternatives.

Incident Support Organization	Includes any off-incident support provided to an incident. Examples would be Agency Dispatch Centres, Airports, Mobilization Centres, etc.
Incident Termination	The conclusion of operations at the scene of an incident, usually with the departure of the last unit from the scene.
Information Officer	A member of the Command Staff responsible for interfacing with the public and media or with other agencies requiring information directly from the incident. There is only one Information Officer per incident. The Information Officer may have assistants.
Initial Action	The actions taken by the first resources to arrive at an incident.
Initial Response	Resources initially committed to an incident.
Inter-agency communication	The method of communication externally, or with other agencies
Intra-agency communication	The method of communication internally, or within the same agency
Jurisdiction	The range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities, and authority for incident mitigation. Jurisdictional authority at an incident can be political/geographical (e.g., municipal, provincial, federal, private sector boundary lines) or functional (e.g., police department, health department).
Jurisdictional Agency	The agency having jurisdiction and responsibility for a specific geographical area, or a mandated function. Jurisdictional authority at an incident can be political/geographical (e.g., municipal, provincial, federal, private sector boundary lines) or functional (e.g., police department, health department).
Life-Safety	Refers to the joint consideration of both the life and physical well-being of individuals.
Logistics Section	The Section responsible for providing facilities, services, and materials for an incident.

Management by Objectives	In ICS, this is a top-down management activity which involves a three-step process to achieve the incident goal: (1) establishing the incident objectives, (2) selection of appropriate strategy(s) to achieve the objectives, and (3) the tactical direction associated with the selected strategy. Tactical direction includes selection of tactics, selection of resources, resource assignments, and performance monitoring.
MELP	Ministry of Environment, Lands and Parks (BC)
Mitigation	Procedures taken or implemented to reduce severity. In emergency management, mitigation can take the form of an emergency preparedness program, which would include an emergency plan designed to assist in coordinating response to save lives and protect property from damage.
Mobilization	The process and procedures used by all agencies and organizations activating, assembling, and transporting all resources requested to respond to or support an incident.
Mobilization Centre	<p>An off-incident location at which emergency service personnel and equipment are temporarily located pending assignment, release, or reassignment.</p> <p>Modular Organization: There are occasions when incidents increase or decrease in response size and demands. In order to meet these needs systematically, the organizational structure of the ICS must adapt accordingly. Similar to the span-of-control, an Incident Commander may initiate additional sections, branches and divisions with specific assignments. As response begins to wind down, the additional units will correspondingly cease operations. ICS can be optimized to accommodate up 2,500 persons.</p>
Multi-jurisdiction Incident	An incident requiring action from multiple agencies that have a statutory responsibility for incident mitigation. Under ICS, these incidents will be managed under Unified Command.
Mutual Aid Agreement	Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

Operational Period	The period of time scheduled for execution of a given set of operation actions as specified in the Incident Action Plan. Operational Periods can be of various lengths, although usually not over 24 hours.
Operations Section	The Section responsible for all tactical operations at the incident. Includes Branches, Divisions and/or Groups, Task Forces, Strike Teams, Single Resources, and Staging Areas.
Provincial Regional Emergency Operations Centre	A facility used to coordinate provincial regional resources to support local authorities responding to events.
Provincial Emergency Coordination Centre	Located in Victoria responsible for overall coordination of provincial resources and assigned federal resources. Disseminates policy direction to PREOCs on behalf of the Central Coordination Group.
Radio Cache	A supply of radios stored in a predetermined location for assignment to incidents.
Reinforced Response	Those resources requested in addition to the initial response.
Resources	Personnel and equipment available, or potentially available, for assignment to incidents. Resources are described by kind and type, such as ground, water, or air, and may be used in tactical support or overhead capacities at an incident.
Section	The organization level with responsibility for a major functional area of the incident, e.g., Operations, Planning, Logistics, Finance/Administration. The Section is organizationally between Branch and Incident Commander.
Single Resource	An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.
SOGs	Standard Operating Guidelines, which outline protocols of actions for a particular type of incident or agency.
SOPs	Standard Operating Procedures, which define an established protocol of actions for a particular type of incident or agency.
Span of Control	The supervisory ratio of from three-to-seven individuals, with five-to-one being established as optimum.

Staging Area	Staging areas are locations set up at an incident where resources can be placed while awaiting a tactical assignment. Staging areas are managed by the Operations Section.
Strategy	The general plan or direction selected to accomplish incident objectives.
Tactical Direction	Direction given by the Operations Section Chief, which includes the tactics appropriate for the selected strategy, the selection and assignment of resources, tactics implementation, and performance monitoring for each operational period.
Technical Specialists	Personnel with special skills that can be used anywhere within the ICS organization.
Triage	Priority setting. For example: in communications triage, communicators must decide, due to the convergence of calls, what critical information to relay in priority of importance. Triage is more commonly used by medical personnel to determine which injuries must be treated first in an emergency situation. Life threatening injuries take priority.
Unified Area Command	A Unified Area Command is established when incidents under an Area Command are multi-jurisdictional. (See Area Command and Unified Command.)
Unified Command	Under ICS, Unified Command is a unified team effort which allows all agencies with responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies. This is accomplished without losing or abdicating agency authority, responsibility, or accountability.
Unit	The organizational element having functional responsibility for a specific incident planning, logistics, or finance/administration activity.
Unit Integrity	Although multi-agencies are coordinated for an overall common response goal, they operate as single units. For the safety of the various responders, police personnel work with police personnel, and fire personnel work with fire personnel. This manner of organization simplifies personnel administration and intra- and interagency communication.

Unity of Command

The concept by which each person within an organization reports to one and only one designated person.

Wireless Priority Service

An enhancement to basic mobile service that allows Public Safety and Emergency Preparedness (PSEP) calls to queue for the next available service channel while minimizing impact on consumer access to the same wireless infrastructure.

APPENDIX ONE

BRITISH COLUMBIA LEGISLATION AND EMERGENCY PROCEDURES

Provincial Emergency Preparedness Legislation in BC

Paper, paper, and more paper. It is a necessary evil in government, and you should know that in the government emergency management realm, there is a hierarchy of documents that is important to understand.

Legislation (Law) is obviously the most important level in the hierarchy, and the Government of British Columbia has enacted the Emergency Program Act as the document, which enables the Provincial Emergency Program to exist. The Act also specifies the basic rules which will apply (relatively briefly and in legal terms) and so the Act is the cornerstone upon which all other emergency management documents must be built. The Emergency Program Act is changed only infrequently, and the Act therefore authorizes publishing of Regulations by government to elaborate upon certain key provisions of law, and how they will be administered.

Regulations are also legal documents, and have the effect of law in that they are published pursuant to an Act. Although also approved at the highest level of government, they are easier to publish and change than Legislation, but they still tend to be long-standing and relatively brief, and written in legal language.

Strategies in British Columbia Emergency Management practice, are based on Legislation and Regulations, and reflect the highest level of document that is not law. A Strategy is agreed to by the British Columbia Inter-Agency Emergency Preparedness Council (or perhaps Cabinet on recommendation of the IEPC), and will attempt to break legalese into plain English for further management action by public servants. A Strategy is usually limited in scope; fairly long-standing in application; and relatively easy to modify.

British Columbia Emergency Management System (BCEMS) is an emergency response management system developed through Interagency Emergency Preparedness Council (IEPC) to ensure a standardized emergency management all hazards approach is adapted by provincial government ministries, agencies and Crown Corporation.

Emergency Plans reflect the Strategy (where one exists) and of course they are written within the context of the law in any case. Plans may be hazard-specific or more general, and (hopefully) easily understandable by the people who have to use them. If the plans require multi-agency actions, they are agreed to by the agencies involved at the time of publishing. Because they include much more detail about organizations, tasks, and responsibilities, they are subject to fairly frequent modification (amendment). Procedures are sometimes included in Plans, but may also be published separately.

Guides are sometimes published to expand upon or explain (in simple terms) any of the formal documents above. They can take the form of handouts for the media and the public, or even detailed manuals to provide an overview for persons generally unfamiliar with emergency management.

Emergency Program Act of BC

The *Emergency Program Act* and the *Emergency Program Management Regulation* (see Appendix A) is an administrative document, which provides interpretive, administrative and directional policies for governmental action in the event of a major emergency or disaster in British Columbia. It outlines the emergency declaration procedures, chain of authority, roles and responsibilities, powers, planning, response, recovery and financial information. It was assented to July 29, 1993 [Consolidated November 25, 1993]

Interpretation

(1) In the *Emergency Program Act*:

“declaration of a state of emergency” means a declaration of the minister or the Lieutenant in Council under section 9 (1);

“declaration of a state of local emergency” means a declaration of a local authority or the of a local authority under section 12 (1);

“director” means the person appointed under section 2 (3) as the director of the Provincial Program;

“disaster” means a calamity that is caused by

- a) accident, fire, explosion or technical failure or by the forces of nature, and
- b) has resulted in serious harm to the health, safety or welfare of people, or in widespread damage to property; “electoral area” has the same meaning as in section 766 of the Municipal Act;

“emergency” means a present or imminent event that

- a) is caused by accident, fire, explosion or technical failure or by the forces of nature, and
- b) requires prompt coordination of action or special regulation of persons or property to protect the health, safety or welfare of people or to limit damage to property;

“Government Corporation” has the same meaning as in the Financial Administration Act;

“head of a local authority” means

- a) for a municipality, the mayor or a person designated by the municipal council to act in the capacity of mayor in the mayor’s absence, and
- b) for an electoral area in a regional district, the chair of the board of the regional district, or, in the chair’s absence, a vice chair;

“local authority” means

- a) for a municipality, the municipal council,
- b) for an electoral area in a regional district, the board of the regional district if the regional district has been granted the powers of a municipality under section 790 (2) (b) of the Municipal Act, or
- c) for a national park, the park superintendent or the park superintendent’s delegate if an agreement has been entered into with the government of Canada under section 4 (2) (e) in which it is agreed that the park superintendent is a local authority for the purposes of this Act;

“jurisdictional area” means any of the following for which there is a local authority:

- a) a municipality;
- b) an electoral area;
- c) a national park;

“local emergency plan” means an emergency plan prepared under section 6 (2);

“municipality” means the corporation into which the residents of an area have been incorporated as a municipality under any Act and includes the City of Vancouver, but does not include an improvement district or a regional district;

“Provincial Emergency Program” means the Provincial Emergency Program continued under section 2 (1);

“Provincial emergency plans” means the emergency plans prepared under section 4 (1);

“volunteer” means a volunteer registered by a local authority or the Provincial Emergency Program.

(2) A local authority has responsibility under this Act for the jurisdictional area for which it is the local authority.

Administration

(1) The Provincial Emergency Program is continued.

(2) The Provincial Emergency Program is responsible for carrying out the powers and duties vested in it by this Act, the regulations and the minister.

(3) A director and any officers and employees required to enable the Provincial Emergency Program to perform its duties and exercise its powers may be appointed in accordance with the

Public Service Act

Committees

(1) The minister may appoint the committees the minister considers necessary or desirable to advise or assist the Lieutenant Governor in Council, the minister or the director.

(2) The members of committees appointed under subsection (1) who are not officers or employees of the government, or officers or employees of an agency of the government, are to be reimbursed for reasonable traveling and out of pocket expenses necessarily incurred in the discharge of their duties under this Act and may be paid remuneration for their services as the Lieutenant Governor in Council may order.

Powers and duties of the minister

(1) The minister must prepare emergency plans respecting preparation for, response to an recovery from emergencies and disasters.

(2) The minister may

- a) conduct public information programs relating to emergency preparedness and recommend preventive measures to alleviate the effects of emergencies or disasters,
- b) make surveys and studies to identify and record actual and potential hazards that may cause emergencies or disasters,
- c) make payments and grants, subject to any terms or conditions that the minister may impose, to local authorities for the purposes of assisting in emergency prevention, preparedness and response,

- d) enter into agreements with and make payments or grants, or both, to persons or organizations for the provision of services in the development or implementation of emergency plans or programs,
- e) enter into agreements with the government of Canada or of any other province, or with any agency of such a government, dealing with emergency plans and programs,
- f) review and recommend modification of local emergency plans of local authorities,
- g) establish training and training exercise programs,
- h) provide support to volunteers as prescribed in the regulations, and
- i) delegate in writing to the director any of the powers or duties vested in the minister by this Act, except the power
 - i. to make a declaration of a state of emergency,
 - ii. to cancel a declaration of a state of emergency,
 - iii. to cancel a declaration of a state of local emergency, or
 - iv. to make an order under section 13 (2).

Ministerial orders

The minister may, by order,

- a) divide British Columbia into various subdivisions for the purpose of organizing integrated plans and programs in relation to emergency preparedness, response and recovery,
- b) require local authorities of the municipalities or electoral areas located within a subdivision referred to in paragraph (a) to prepare, in cooperation with designated ministries, integrated plans and programs, satisfactory to the minister, to deal with emergencies,
- c) establish procedures required for the prompt and efficient implementation of plans and programs to meet emergencies and disasters, and
- d) require a person to develop plans and programs in cooperation with one or more local authorities, designated ministries and government corporations and agencies to remedy, alleviate or meet any emergency that might arise from any hazard to persons or property and that is or may be created by:
 - i. the person engaging in any operation,

- ii. the person utilizing any process,
- iii. the person using property in any manner, or
- iv. any condition that exists or may exist on the person's real property.

Local authority emergency organization

(1) Subject to sections 8 (2), 13 (2) and 14 (3), a local authority is at all times responsible for the direction and control of the local authority's emergency response.

(2) A local authority must prepare or cause to be prepared local emergency plans respecting preparation for, response to and recovery from emergencies and disasters.

(3) A local authority for a municipality or an electoral area must, for the municipality or electoral area for which it has responsibility, establish and maintain an emergency management organization to develop and implement emergency plans and other preparedness, response and recovery measures for emergencies and disasters and may

- a) appoint committees the local authority considers necessary or desirable to advise and assist the local authority, and
- b) appoint a coordinator for the emergency management organization.

(4) A local authority may, in writing, delegate any of its powers and duties under this Act to the committee, emergency management organization or coordinator referred to in subsection (3) except the power to make a declaration of a state of local emergency.

B.C. Provincial Emergency Program (EMBC)

EMBC is administered by the Ministry of Attorney General and its mandate is to maintain and enhance effective emergency preparedness, response and recovery programs and to mitigate human suffering and property loss caused by actual or imminent emergencies and disasters in British Columbia.

Functions of EMBC

- Provision of a leadership role in emergency planning for the Province and its agencies
- Provision of advice and assistance to Regional and Municipal governments in emergency planning
- Provision of advice and assistance to industry
- Creation of public awareness for the need for emergency preparedness

- Coordination of provincial emergency response
- Direction of operations for those emergencies which are not assigned to another Ministry of Government
- Establishment, maintenance and operation of the Provincial Field Response Centre or Provincial Emergency Coordination Centre for major emergencies
- Provision of training courses for provincial government staff, municipal officials, volunteers and the public
- Administration of the Disaster Financial Assistance (DFA) Program
- Provision of support to mandated search and rescue agencies
- Provision of support and assistance to emergency service volunteers

Mandate and Role of the Inter-agency Emergency Preparedness Council of BC (IEPC)

- The IEPC is composed of one representative from every Provincial Government Ministry, plus the Provincial Emergency Program
- The Council recommends preparedness, response and recovery measures to each Ministry and ensures coordination between Ministries.

Local Emergency Planning

- A local authority is at all times responsible for the direction and control of the local authorities emergency response
- A local authority must prepare, or cause to be prepared, local emergency plans respecting preparation for, response to, and recovery from emergencies and disasters
- A local authority for a municipality or an electoral area must establish and maintain an emergency management organization and may:
 - appoint committees as necessary or desired
 - appoint a coordinator for emergency management.
- A local authority may delegate any of its powers to the above except the power to declare a state of emergency

Duties of Local/Municipal Area Coordinator

- Liaise with the EMBC Regional Manager

- Coordinate/advise on emergency program planning and response at a local level
- Plan, formulate and conduct exercises and training as required
- Develop and maintain a community emergency plan
- Chair or participate in the local emergency planning committee
- Advise local elected and appointed officials and staff about emergency preparedness, response and plan development
- Promote mutual aid agreements
- Integrate volunteer resources into the plan

Emergency Planning Committees

- Usually composed of department heads of agencies and organizations identified in the emergency plan
- Focus on strategic initiatives and projects
- Develop policy and implementation procedures for presentation to local government officials
- Advise on local Emergency Program development
- Assist emergency coordinator with development and integration of departmental plans into municipal plan
- Provide volunteer and non-departmental agencies (e.g. Telus) with a local platform for representation and consultation

