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MINISTRY OF FORESTS

INVENTORY BRANCH

SAFETY MANUAL
(Interim Version)

1979

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SAFETY MANUAL
(Interim Version)

1979

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PART I

CHAPTER 1 OF THE FOREST INVENTORY FIELD POCKET MANUAL

(Interim Version 1979)

EMERGENCY AND SAFETY PROCEDURES

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PART I

CHAPTER 1 OF THE FOREST INVENTORY FIELD POCKET MANUAL
(Interim Version 1979)

EMERGENCY AND SAFETY PROCEDURES

1.0 CONTACTS IN CASE OF EMERGENCY

Safety comes first! Prevent accidents! Work safely!

In case of an accident, the first and most important step is to administer first aid to the injured person. Keep calm! All employees are required to study this manual at regular intervals, so that they know what to do in case of an emergency. Remember, in the event of injury, (FIRST STEP) administer first aid, (SECOND STEP) secure medical assistance, including hospitalization if necessary, and (THIRD STEP) notify the Inventory Branch and the relevant Regional staff.

Persons to be contacted in the event of personnel injury, severe illness, fatality, overdue personnel, or other emergencies:

1.1 INVENTORY BRANCH - VICTORIA

NAME	TITLE	OFFICE PHONE	HOME PHONE
Frank Hegyi	Director	387-6722	477-0709
Shirley Kerr	Administrative Officer	387-1345	383-0049
Carlos Martins	Safety Officer	387-5595	382-2047
Ted Vaughan	Manager, Regional Inventory	387-1345	721-3819
Cliff Calder	Manager, Resource Statistics	387-3541	658-5592
Doug Fligg	Manager, Depletion & Update	387-1345	658-5094
George Allison	Manager, Growth & Yield	387-3541	658-5472

1.2 REGIONAL PERSONNEL

LOCATION	NAME	TITLE	OFFICE PHONE	HOME PHONE
Vancouver	A.C. McPherson	Regional Manager	668-2470	294-0705
Vancouver	Mel Scott	Inventory Forester	668-2528	274-2772
Prince Rupert	J.A. Bickert	Regional Manager	{ 624-2121 624-5334 (night)	624-9751
Prince Rupert	Boyd Brown	Inventory Forester	624-2121 local 228	624-9368
Prince George	D. Grant	Regional Manager	{ 564-0778 562-8144 (night)	564-9025
Prince George	Gary Darychuk	Inventory Forester	564-0778 local 263	564-4277
Williams Lake	J.A.D. McDonald	Regional Manager	{ 392-6261 392-3244 (night)	398-8317
Williams Lake	Bruce Schellenberg	Inventory Forester	392-6261 local 203	392-6708
Kamloops	A.B. Robinson	Regional Manager	{ 374-7741 374-7744	
Kamloops	Brent Olsen	Inventory Forester	374-7741 local 361	376-4692
Nelson	M.C. Isenor	Regional Manager	{ 354-4181 354-4181 (night)	352-2837
Nelson	Rick Baker	Inventory Forester	354-4181 local 255	352-9351

1.3 USEFUL PHONE NUMBERS (to be filled in by the holder of this manual)

Local R.C.M.P. or Police: _____

Local Hospital: _____

Local Ambulance: _____

Local Helicopter Base: _____

Local Fixed Wing Base: _____

Note: to report an aircraft or marine distress, call Operator and say "Aircraft Distress" or "Marine Distress" (as the case may be). Your information will be received by the Rescue Coordination Centre. (All long distance calls are paid for by the Department of National Defence).

The next of kin will be notified by the most senior person of the Inventory Branch (who is available at the time of the accident or emergency).

Do not release names of injured persons to the press or public prior to next of kin being notified. In any case, obtain advice from Inventory Branch H.Q. prior to any news release.

When reporting accidents by radio, use only code numbers when referring to injured personnel. (Fill in code sheet at end of Chapter 1).

AT ALL TIMES: WORK SAFELY ... PREVENT ACCIDENTS ...

2.0 BASIC FIRST AID

Treat injuries in order of priority: (FIRST) breathing, (SECOND) bleeding, and (THIRD) fractures.

2.1 ARTIFICIAL RESPIRATION

Before beginning artificial respiration, check the pulse (carotid artery to the left of the Adams apple). If there is no pulse, begin cardio-pulmonary resuscitation. If there is a pulse then start artificial respiration:

1. Place victim on back. Clear mouth and throat.
2. Open airway. Lift victim's neck with one hand and tilt head back with the other.
3. Pinch nostrils to stop air leakage. Maintain open airway by keeping the neck elevated.
4. Seal your mouth tightly around victim's mouth and blow. Watch for chest expansion out of the corner of your eye.
5. Remove your mouth, listen for air to come out of victim's lungs and look for victim's chest to fall.
6. Repeat steps 3 to 5 twelve times a minute. Don't give up!

2.2 BLEEDING

Control by:

1. Keeping the wounded area above heart level if possible.
2. Applying pressure to the wound with a gauze pad, dried seaweed, sphagnum moss or clean singed cloth.

Note: a tourniquet is extremely drastic treatment, and should only be applied by a skilled first-aid man.

2.3 BLISTERS

Alleviate pain and friction by:

1. Applying a wide band of adhesive tape smoothly over - and well beyond - the margins of the "hot spot".

2.4 BROKEN BONES (FRACTURES)

Treat as follows:

1. Splint both the joint above and the joint below the fracture with available resources (e.g. saplings, tally bag, etc.).
2. The extremity may usually be splinted in a position of some deformity. If it is apparent the fracture might penetrate the skin (e.g. in the case of some ankle fractures), a skilled first-aid man may apply traction and straighten the deformity.
3. Pad splints carefully.
4. Check splint ties frequently to be sure they do not interfere with circulation.
5. In open fractures, place ring pads around the wound and cover them with a sterile dressing prior to splinting.

2.5 BURNS

1. Treat for shock.
2. Avoid contamination of the burned flesh.
3. Soak in cold water to relieve pain (30 minutes). But do NOT soak third degree burns (exposed flesh).
4. Cover with a piece of sterile gauze and bandage firmly.
5. Offer the victim more water than usual.

Note: do not apply greasy substances to the burn.

2.6 DIARRHEA

1. Boil drinking water for three to five minutes (one additional minute for each 300 m altitude).
2. Avoid overeating in hot weather, fatigue, dirty

eating and cooking utensils, and contamination from someone else who has diarrhea.

3. Take occasional sips of water and eat banana and scraped apple.

2.7 FOOD POISONING

1. Send for medical aid.
2. Preserve a sample of the suspected cause.
3. Do not induce vomiting when the casualty is unconscious, otherwise assist him to vomit.

2.8 HEAT EXHAUSTION

The symptoms of heat exhaustion may be present in any combination. They are: nausea, cold and clammy skin, faintness, weakness and perhaps a rapid pulse.

Treat by:

1. Allowing the victim to rest.
2. Administering salt tablets and plenty of liquids (e.g. salty soup).

2.9 HYPOTHERMIA

Immediate and positive treatment is required:

1. Get victim out of the cold, wind, and rain.
2. If possible, strip off all wet clothes, get victim into dry clothes and into a warm sleeping bag; well-wrapped warm rocks placed near the victim will help (i.e. warm rocks from a nearby fire).
3. Give victim warm drinks (non-alcoholic).
4. If the victim is semiconscious or worse, try to keep him awake and give him warm drinks. If possible, strip all clothes from the victim and put him into a sleeping bag with another person (also stripped). This skin-to-skin contact is the most effective treatment.

2.10 SHOCK

To prevent and to control shock:

1. Treat injuries in order of priority:
 - (a) lack of breathing - restore;
 - (b) bleeding - stop;
 - (c) fracture - immobilize with care.
2. If there are not serious head or chest injuries, place patient flat on back with head and chest lower than legs.
3. Elevate the upper body if serious head and chest injuries are present. Incline the patient to the injured side for severe chest injuries to assist the functioning of the uninjured lung.

4. Reassure the patient.
5. Loosen clothing about the neck, chest and waist if possible.
6. If the patient becomes unconscious, place in the face down position to prevent choking on blood, vomit or tongue (3/4 prone position).
7. Keep the patient warm and sheltered with all available resources (clothing, sleeping bag, tent, etc.). Don't forget to place material UNDER as well as over the patient.
8. Comfort and reassure the patient again and again.

2.11 SPRAINS

- Simple:
1. Wrap with elastoplast or bandage.
 2. Cold compress (e.g. creek water) if possible.
 3. Elevate and rest when possible (e.g. lunch break).
- Serious:
1. Apply cold compress to the sprain to reduce swelling (for at least the first 24 hours).
 2. Once the swelling has subsided significantly, leave the sprain alone for a day, and then begin applying heat to speed healing.
 3. Keep the sprain splinted and immobile until after the pain has diminished (often for more than one week).

3.0 WHEN LOST IN THE BUSH

Do as follows:

1. Remain calm.
2. Take stock of what you have with you.
3. Sit down, relax, then try to figure out where you are.
4. Take out your compass.
5. Set a bearing to and proceed towards a high point to orient yourself and to improve the chances of your being spotted.
6. Do not walk yourself into a state of exhaustion; conserve energy.
7. If you have not oriented yourself by twilight, decide to spend the night in the bush. Make this decision earlier when exhibiting signs of exhaustion or hypothermia.

8. Prepare to bivouac by

- (i) checking instructions in flare kit
- (ii) preparing a smoke-signal fire
- (iii) laying out ground-to-air signals if necessary or possible
- (iv) making shelter and building a night fire
- (v) conserving food

Note: stay put when you have been spotted unless otherwise directed by the searchers.

4.0 EMERGENCY SIGNALS

4.1 RADIO CODE FOR AIR ASSISTANCE

- Class A (Alpha) - Emergency. Require doctor to be flown in immediately.
- Class B (Bravo) - Emergency, but no doctor required. Need air transport immediately.
- Class C (Charlie) - No emergency, but require medical attention. Fly out as soon as possible.
- Class D (Delta) - No medical attention required. Fly out as soon as possible.

4.2 GROUND TO AIR SIGNALS

Require doctor - serious injury	I
Require medical supplies	II
Unable to proceed	X
Require food and water	F
Require map and compass	O
Require radio	--
Indicate direction to proceed	K
Am proceeding in this direction	→
Will attempt to take off	∇
Aircraft seriously damaged	□
Require fuel and oil	┌
All well	└
No	Z
Yes	Y
Not understood	└┐
Require engineer	W
Drop here	T
Require helicopter	H

4.3 AIR TO GROUND SIGNALS

Visual signals to be used in emergencies and fire protection work:

Proceed to target, circle three times	-	Answer to \sphericalangle , or fire or target here
Low pass over drop area, revving motors	-	Take cover: air drop coming
Pass or drop area, wobbling wings	-	Finished dropping or signals recognized

5.0 AIRCRAFT AND MARINE EMERGENCY

Because an emergency may be of news interest, withhold names of persons involved until you know that the next of kin have been notified.

Report to someone at the Inventory Branch or Regional office (see list of personnel and telephone numbers):

1. aircraft or boat identification,
2. the names of the pilot and personnel involved,
3. the date and time of the last position report,
4. the location of the aircraft or boat at the time of the last position report, and
5. the map reference, the flight plan and the relevant aerial photo numbers.

If you are unable to contact one of the listed persons at the Inventory Branch, the Regional office or at home, then call Operator and say "Aircraft Distress" or "Marine Distress" (as the case may be). Your information will be received by the Rescue Coordination Centre.

CODE SHEET

NAME

CODE

NOTES

PART II

CHAPTER 10 OF THE GENERAL ADMINISTRATION MANUAL

(under revision)

SAFETY

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A MESSAGE FROM THE PROVINCIAL SECRETARY

"Your safety is our prime concern.

Subject to the overriding necessity to take all reasonable steps to protect the general public, it is the POLICY OF THIS GOVERNMENT that: every level of management and supervision in the Service has the prime responsibility:

to take all reasonable steps to protect the safety of all employees against work accidents and occupational health hazards;

to comply with all relevant regulations and standards of governments, agencies, and other competent authorities respecting occupational safety and health;

to give first priority to safe working conditions, job safety training, and enforcement of safe practices in the planning, budgeting, direction and discharge of all Government operations;

to formulate and carry out continuing effective safety programs suited to the conditions and hazards of departmental operations, where necessary adopting standards and practices in excess of legal and regulatory requirements.

It is the responsibility of every employee:

to comply with safety and health regulations and directives;

to adopt a responsible attitude toward safety on the job.

No one benefits from work accidents. We must work as a team to achieve safe performance - for your safety and for the safety of those who work with you."

10 SAFETY

10.0 POLICY

10.01 FUNDAMENTAL REQUIREMENTS

There are three fundamental requirements in any accident prevention program. They are: the will of both the senior administration officials and the employees to prevent accidents; a safe working environment, and the safe performance of the employees in that environment.

- (1) The first consideration, the will to prevent accidents, should extend from the senior administrator to the newest employee. It must be borne constantly in mind that it is the employee who suffers the injury even though the cost involved by loss of services and medical care is borne by the government. The ultimate goal is the employee's safety; therefore, he should participate in every phase of the program for which his experience and training adapt him. The initial impetus for accident prevention necessarily must come from the top, but active and continual cooperation by the administrator will inevitably result in the cooperation of the employee.
- (2) The next consideration is the working environment. Buildings and machines should be properly maintained, dangerous processes should be protected or altered, special personal protective equipment should be provided and every possible physical hazard eliminated.

The provision of a safe working environment is one of the best ways in which to demonstrate a desire for accident-free operation. Employees will not be impressed with the need for safety if unguarded belts, pulleys, gears and machines are permitted to be operated. If there are holes in the floors, lighting is substandard, or defective tools and equipment are supplied, employees cannot be blamed if rules pertaining to good housekeeping or safe use of machines, tools and equipment are neglected.
- (3) The third consideration is safe performance by the workers. Training men to be safe workers is more difficult than creating a safe working environment. This problem can be attacked in two ways: by careful selection of employees and by training employees in safe methods. The past accident record of an applicant for work should be checked, as a person who has developed a bad record in one position may do so in another.

The safety training of workers is never finished. It starts with their first interview for employment and continues through their working years.

GENERAL REQUIREMENTS

- (1) Accident prevention shall be undertaken aggressively as a definite and continuing part of all British Columbia Forest Service activities. The active support of all Forest Service personnel will be enlisted.
- (2) Safety research of our own and of other organizations will be used to carry out our policy of integrating safety into all work planning, execution and inspection.
- (3) All accidents or significant "near misses" will be reviewed and reported. Steps will be taken to ensure that necessary measures are implemented to help prevent recurrence. In the event of serious or fatal accidents, it shall be the responsibility of a senior Regional or Branch officer to make an investigation and submit his findings to the Chief Forester forthwith. In this report, attention should be given to recommendations designed to prevent similar accidents.
- (4) Whenever possible, a Forest Officer will stay with an accident victim until he is in the care of a doctor, hospital staff, or qualified first-aid personnel, depending on the seriousness of the injury.
- (5) Wherever applicable, recognized safety codes or standards shall be observed in the course of Forest Service work. The First Aid Regulations of the Workers' Compensation Board of British Columbia shall be satisfied. Where applicable, the standards of other regulatory agencies (i.e. M.O.T., Ministry of Health) will be taken as the minimum acceptable standards.
- (6) Safe working rules should be developed before new projects are started, or new machines, equipment and work methods are put to use.
- (7) Officers responsible for obtaining equipment shall recommend and/or purchase only types of equipment and materials that are safe to use.
- (8) All Forest Service employees in a supervisory capacity, at any level, shall consider employee safety, and the implementing of accident prevention policies, to be an integral part of their administrative responsibility and shall set a good example by their own actions.
- (9) Where there are concentrations of employees, safety councils or committees shall be set up to:
 - a) advise and recommend on safety programs and procedures;
 - b) review accidents and significant "near misses" and recommend how to prevent similar occurrences;

- c) stimulate interest in accident prevention; and
 - d) assist in developing better job attitudes and safer work methods.
- (10) All Forest Service personnel must familiarize themselves with safety rules that apply to their work and to any other field of work they may enter in the course of duty.
 - (11) It is the duty of every Forest Service employee to protect himself and his fellow workers from accidents.
 - (12) All hazardous work contracts shall contain special duty clauses, tailored to fit existing conditions, and to adequately protect personnel of the Forest Service and the contractor.
 - (13) Where a workman is employed under conditions where he might not be able to secure assistance in case of injury, the employer shall check on the well-being of the employee at reasonable intervals.
 - (14) There shall be an effective means of communication between the location of the First-Aid Attendant and the work areas he is to serve.

10.1 ACCIDENT INVESTIGATION AND REPORTING

10.11 NECESSITY FOR REPORTS

- (1) To find basic causes of accidents.
- (2) To determine responsibility and liability.
- (3) To provide facts for a comprehensive accident prevention program.

10.12 GENERAL

- (1) Every injury and property damage accident shall be investigated immediately.
- (2) The scene of the accident shall be kept as undisturbed as possible until investigated. The first step is a personal visit by the investigating officer to the scene as soon as possible after the accident.

- (3) The report shall contain clear, concise statements of where, when, how and why the accident occurred. Cross references should be made to attached witness statements, pictures and sketches. Details which may seem trivial to the reporter, due to familiarity, should not be omitted.
- (4) The person reporting an accident should not be influenced by his personal acquaintance with the person involved in the accident. Remember, an accident which results in minor injury on one occasion may result in death on another.
- (5) It also should be borne in mind that a written report may be the only information on which reviewing officers can base an opinion. For this reason, omitting information could result in misplaced blame or the imposition of unnecessary restrictions.

10.13 PROCEDURES IN EVENT OF FATALITY, SERIOUS INJURY, OVERDUE AIRCRAFT, BOAT OR PERSONNEL

10.131 Fatalities

Employees at the Accident Location:

- (1) KEEP CALM ... KEEP A LOG OF ALL THAT HAPPENS. If you are involved with an on-the-job fatality, your attention to circumstances and quick, calm treatment of the victim will make things easier on all concerned. Remember that morale can be maintained if everyone is usefully occupied.
- (2) A major requisite is to keep pessimism, depression, and panic under control and maintain mental balance.
- (3) Report the incident to the deceased employee's supervisor as soon as possible. DO NOT RELAY NAMES OVER THE RADIO. It is sufficient to indicate there has been an accident resulting in the death of a worker. Report the incident by telephone if possible, but not if it will necessitate delay in reporting. Pre-planned Personnel Code lists are useful when crews are working in remote locations dependent on radio communication.
- (4) Your report should include:
 - a) The exact location of the accident scene.
 - b) Whether there are any injured.
 - c) Whether aid and/or police have been summoned.

- (5) Protect the scene. Keep curious outsiders away and render all possible first aid and assistance to any injured persons. Cover the deceased as soon as possible. Make notes and/or a sketch of the scene before too much disturbance takes place.

Employee(s)'s Supervisor:

Notify Authorities Outside the Service

- (1) The responsible supervisor must notify the local or nearest police detachment immediately. Request medical assistance and transport if death is uncertain. If the person is obviously deceased, then removing the body from the scene is illegal without a coroner's permission. The police will advise what to do under these circumstances.

Notify Regional Office and Branch Headquarters

- (2) The person immediately in charge of the work area in which the accident occurred will report the particulars, without delay, to the Regional Manager or Branch Director, or the most senior staff member available. During the fire season, the Duty Officer is the most readily available, particularly on weekends. Also ensure that the senior Inventory Forester in the Region is notified as soon as possible.

Explain Pertinent Details

- (3) Compile as many facts regarding the accident as possible. Get names of witnesses and record their observations. Ensure that all details, no matter how minor they may seem at the time, are recorded. Times are especially important.

Do Not Release Any Names to the Press or Public

- (4) If possible, arrange to have experts flown to the site by helicopter. Try to make arrangements to have the deceased pronounced dead by a Medical Doctor, right at the site. These arrangements should be made in cooperation with the coroner or the police.

The Region or Branch Headquarters' Function:

- (1) Ensure that the police authorities have been notified if conditions preclude notification at the accident area.

Notify the Deceased Person's Family

- (2) In the case of a fatality, find out the next of kin so that they can be notified. Serious accidents are to be treated with the same consideration as fatal accidents. Notification has to be made personally, NOT by telephone.

- (3) If at all possible, the notification of the next of kin should be carried out by a member of the Forest Service. Relatives, fellow employees or close friends of the family who volunteer can assist in notification. Do your best to ensure that where appropriate, both parents are notified.
- (4) The person giving notification to the family should be prepared to stay until relatives or friends arrive to console the family and to take charge. Forest Service employees, police or even counselling services may be utilized when the immediate family is away from the location of the accident.
- (5) When the next of kin are minors, ensure that the oldest member is advised. If they are too young, call on a relative as well. Notification must be done as soon as possible.
- (6) The police will assist by notifying the next of kin if they are domiciled in another region or travelling, etc. but they would prefer not to carry out the duty if Forest Service personnel, a family friend or clergyman can complete the task.
- (7) Once notification has been completed, the appropriate police detachment should be informed without delay.
- (8) Send out a staff member to investigate the accident as soon as possible. Document all related information and take photographs at the scene.
- (9) Notify the Assistant Deputy Minister - Chief Forester of the accident. During the fire season, the Provincial Standby Officer will be available at all times. Otherwise, call the Chief Forester or any of the other senior Victoria staff available.
- (10) Notify Personnel Branch in Victoria, they will in turn notify the Provincial Coordinator of Accident Prevention, the Ministry Safety Officer and Information Branch.
- (11) All work-related fatal or other serious accidents are to be reported to the Accident Investigation Branch of the Workers' Compensation Board. Do this either through the local Accident Investigations Officer or through the Board's 24 hour service in Vancouver at 266-0211.
- (12) Victoria Branches: if Branch rather than Regional personnel are involved, notify the Regional Manager or Ranger in whose jurisdiction the incident has occurred as soon as possible.

10.132 Serious Injury (Requiring Hospitalization)

Employee(s) at the Accident Location:

- (1) If a serious injury occurs, request medical assistance, ambulance or other suitable emergency transportation immediately. Assist the injured and make them comfortable.
- (2) Notify the employee's immediate supervisor at the earliest opportunity. Again, NO NAMES unless you know your conversation is private. Advise upon the nature of the accident, the number of persons involved, and specify what assistance is required.

Employee(s)'s Supervisor:

- (1) Notify the Regional Headquarters, advising Regional Manager, A.D.F., i/c Protection, or the most senior member available. During the fire season, contact the Duty Officer. Notify the above without delay, and report all the particulars.
- (2) Follow the procedures outlined under "Fatalities" except that it will not be necessary to notify the coroner unless a fatality is involved.

10.133 Vehicle Accidents Resulting in Serious Injury or Death

- (1) Follow procedures as outlined above.

10.134 Aircraft Overdue

Job Site Supervisor:

- (1) Steps outlined below must be initiated by the project or work site supervisor who is responsible for dispatching the aircraft involved.
- (2) If the aircraft is unreported after 1 hour and there is not sufficient reason to extend that period, then the following steps must be taken:
 - a) Contact departure point and/or destination to ensure the aircraft is in fact en route and overdue.
 - b) Contact aircraft's base to determine if pilot has been in contact with them.
 - c) Contact your headquarters office and give them the following details:
 - i. Name of airline and aircraft's base location.
 - ii. Type of aircraft and call sign (i.e. CF-XYZ).
 - iii. Time and place of aircraft's departure.

- iv. Expected time of arrival at destination.
- v. Route of aircraft, time and location of last contact.
- vi. Number of passengers on board. A list of their names should be given also but NOT OVER THE RADIO.
- vii. Special equipment carried (i.e. Crash Locator Beacon).

Regional Office or Branch H.Q.:

- (1) Record all pertinent details. Include a list of individuals and agencies contacted to date.
- (2) Advise Regional Manager, Assistant Regional Manager, or i/c Protection and Duty Officer.
- (3) Arrange to have airline company contact the Rescue Coordination Center (Vancouver 732-4141) or do so yourself, if deemed appropriate. (This organization may be requested to have their resources standby only and not start procedures until requested).
- (4) Contact R.C.M.P. Advise extent of Forest Service resources in action.
- (5) DO NOT release information to outside inquiries.
- (6) If aircraft is located, and all is well, notify all parties involved.
- (7) If aircraft is located and an accident is indicated, take emergency measures and employ as many resources as necessary. Follow the emergency measures outlined above in the event of fatalities or serious injury.
- (8) Victoria Branches: if aircraft involved is under Branch contract, inform the Regional Manager or Duty Officer and the Ranger in whose jurisdiction the incident is taking place.

10.135

Boats Overdue

- (1) Reporting of overdue boats and initiating search procedures must be at the discretion of the supervisor, based on knowledge of local conditions, the experience of the personnel involved and the circumstances of the moment. No specific time limit can be set but initiation of search procedures should be timed to make the best possible use of available daylight.

- (2) Reporting procedures would be similar to the procedures in event of overdue aircraft with the following exceptions:
- Boats overdue on salt water contact Rescue Coordination Center (Vancouver 732-4141).
- Boats overdue on fresh water contact R.C.M.P. at nearest detachment.

10.136 Personnel Overdue

- (1) No definite time limit can be set, and reporting must be at the discretion of the supervisor or senior person at the work site.
- (2) It is imperative that a "Check-Out" system be used at all work sites that involve persons coming and going.

10.2 VEHICLE OPERATION

For operating procedures, see Chapter Five MECHANICAL EQUIPMENT.

10.21 ROAD VEHICLES

10.211 Driver Policy

- (1) All Forest Service drivers shall adopt the habit of defensive driving, which means:
- a) avoiding accident situations created by other drivers by being constantly prepared for the unexpected;
 - b) avoiding accidents caused by poor road or weather conditions;
 - c) yielding the right-of-way, if necessary, even when, by all rules of the road, he appears to have the right-of-way;
 - d) unstintingly making concessions to other drivers who are thoughtless, unskilled, or ignorant of safe driving practices; and
 - e) leaving room for other vehicles, particularly on corners.
- (2) Any driver who habitually uses poor judgement, or violates driving regulations, or has deficiencies which make him an unsafe driver may, at the discretion of the Chief Forester, be suspended for an appropriate period.

- (3) All drivers will be considered responsible for the safe operating condition of the vehicle they drive. This includes steering, brakes, lights, wipers, turn signals, tires, defrosters and clean windows.
- (4) Drivers will observe all traffic regulations.
- (5) Drivers shall drive at a speed that permits full control of the vehicle, allowing for all factors such as road, weather and traffic conditions. In no case shall the posted speed limit be exceeded.
- (6) On any road, persons driving Forest Service vehicles must never tailgate. At least one vehicle length must be allowed for every 15 kilometers of speed. For example, at 50 kilometers per hour, drivers should allow at least three vehicle lengths between their vehicle and the vehicle ahead.
- (7) Assigned Forest Service vehicles shall not be driven by an unassigned driver, except in an emergency. Keys must not be left in the ignition lock.
- (8) Drivers shall avoid driving when fatigued. All drivers shall pull off the road for a short rest, coffee break, or change of driver if they become drowsy at the wheel due to lack of sleep, long trips, motor drone, straightaways, etc.
- (9) Warning flags, flares and first aid kits must be carried by Forest Service vehicles, as required.
- (10) Safe driving means accepting the responsibility for your own safety and that of other road users.

10.212

Transporting Personnel

- (1) See Workers' Compensation Board Accident Prevention Regulations re: transport of workers.
- (2) Only authorized passengers may be carried in Forest Service vehicles. Hitch-hikers are not to be picked up.
- (3) Seat belts shall be worn by personnel driving or riding in Forest Service vehicles.
- (4) Personnel should not be carried in or on any Forest Service vehicle except on seats properly constructed for that purpose. The movements of the driver shall not be hampered by overcrowding in the front seat.
- (5) Loose tools must not be carried in company with personnel. Boxes or cases, properly secured, should be used to contain tools.

- (6) Explosives and passengers shall not be carried in the same vehicle. A driver's helper may ride in the vehicle when required.
- (7) Gasoline and other volatile, highly flammable or noxious materials must not be carried in the same compartment of a vehicle as the driver or passengers.

10.213 Speed Effect

- (1) Most accidents develop in seconds and are all over in a matter of a few feet. At a relatively slow speed of 50 kilometers per hour a vehicle travels 13.4 metres in one second and requires 26.5 metres to come to a full stop - under ideal conditions.
- (2) A driver who is tempted to press a little harder on the accelerator should ask himself if he is sure he can stop in half the distance visible ahead. He should remember that if he is travelling at 90 kilometres per hour and meets an oncoming vehicle in his lane travelling at the same speed they will meet at 180 kilometres per hour, or 54 metres per second. It is unlikely anyone would survive.
- (3) Forest Service membership is no waiver of speed limits. Drivers should never speed on the way to a fire. It is better to arrive a few minutes later than not at all.

10.214 Carbon Monoxide

- (1) Carbon monoxide, produced by all internal combustion engines, is completely odourless, tasteless and deadly. The only warning of carbon monoxide poisoning is drowsiness. If a driver is already tired, he will not know whether weariness, monotony or carbon monoxide is dulling his senses. If it is carbon monoxide, it is unlikely he will ever know - he will be dead.
- (2) Adequate ventilation is the only protection against carbon monoxide poisoning. Never run a vehicle in a closed building. Always drive with at least one window partly open, no matter how cold the weather. If the entry of exhaust fumes is detected, have the exhaust system repaired immediately - tomorrow may be too late. Exhaust pipes should be sufficiently long to ensure that all exhaust fumes are carried away by the slipstream. Too short a pipe will allow fumes to be drawn back into the vehicle by the partial vacuum caused by movement of the vehicle.

10.215 Motorcycles

- (1) The use of motorcycles has increased greatly over the past few years and so have the accidents directly attributable to their use. The following check list will acquaint the rider with the hazards and actions to be taken so that he can operate his motorcycle safely and efficiently.

<u>Hazard</u>	<u>Action</u>
loose gravel, wet or greasy road surfaces, rough terrain	- Assess conditions. Do not travel at excessive speeds especially on corners. Use low gear.
wet brakes	- Dry brakes immediately after crossing streams, etc.
incorrect chain tension	- Adjust tension to prevent chain from coming off and locking the wheel.
incorrect dress	- Wear sturdy boots and a jacket for protection. Helmet and suitable eye protection mandatory (face shield recommended).
fire	- Shut off the machine while filling the gas tank. Check the exhaust system for proper spark arresters.
incorrect loading, overloading	- Put loads as far forward on the rack as possible to prevent tipping over backwards on uphill climb. DO NOT CARRY PASSENGERS.
inexperience	- Training programme for new operators.
lack of maintenance	- Check daily for loose nuts, cracks, throttle lever, brakes, etc.

10.216 Common Causes of Road Accidents

- (1) Many accidents involving more than one vehicle are the result of discourteous, inconsiderate driving such as:
- failing to signal turn intentions;
 - "land hopping" to save a few seconds, or making a turn from the wrong lane;
 - speeding;
 - cutting in too soon after passing;
 - passing on hills, curves, or in other situations involving restricted vision;
 - losing patience in slow traffic or other restricting situations;
 - becoming fatigued;
 - backing or pulling away from parked position without looking in all directions; and

- 1) disregarding the special hazards of night driving and failing to dip headlights and keep them dipped until the oncoming vehicle or vehicles have passed, or when following behind another vehicle.
- (2) Most accidents involving a single vehicle are the result of poor judgement such as:
- a) speeding or failing to adjust speed to road or vehicle conditions;
 - b) inattention, caused by lighting cigarettes while travelling, looking at maps, admiring scenery, or any other activity than concentrating on control of the vehicle (if anything other than driving requires doing, stop to do it);
 - c) becoming fatigued;
 - d) showing off;
 - e) failing to watch for pedestrians, particularly children; and
 - f) failing to park the vehicle in gear and with brakes on.
- (3) Very few accidents on the road are caused by mechanical failure.
- a) Skids due to bald tires or failure to use snow tires or chains cannot be construed as mechanical failure. You are the driver; make sure your vehicle has as good a grip on the road as possible, and govern your speed accordingly.
 - b) Modern vehicles seldom fail suddenly. Brake inefficiency or steering wear comes gradually. It is up to the driver to make sure the vehicle is in good mechanical order.
 - c) Unnecessary wear to a vehicle is often wrongly construed as accidental or as having been necessary due to emergency. This is seldom true. Many Forest Service vehicles are involved in emergency work and should be kept in good condition for that purpose. Very seldom does emergency excuse abuse.
 - d) As an added precaution when parking under adverse conditions, block or chock the wheels to prevent rolling. Always block the wheels to prevent rolling when changing a wheel.
 - e) All drivers should bear in mind that only the driver is usually to blame for vehicle action that causes accidents.

10.217 Crew Cars and Crummies

- (1) See Regulations 33 to 49 (Part XX) pursuant to the Industrial Transportation Act, chapter 192, R.S.B.C. 1960.

10.22 TRAILER OPERATION

For trailer operation, see Chapter Five - MECHANICAL EQUIPMENT.

10.221 Mechanical

- (1) Wheel nuts must be kept very tight, especially on the braking wheels. Wheel nuts should be checked several times in the first 500 miles running of a new trailer.

10.222 Parking

- (1) Before attempting to raise the hitch off the towing-ball by means of the screw jack, be sure that the wheels are blocked to prevent the trailer from moving when the restraint of the hitch is removed. If this precaution is omitted, it is very probable that the jack will bend or break, especially if the jockey wheel is not used or if it sinks into a soft surface. The best idea is to use a piece of 3/4 inch plywood about 18 inches square and place this under the jockey wheel to enable it to swivel more readily. This is a good idea even though the wheels are blocked because there may be a tendency to slew due to flexing of the tires or springs.

10.223 Oil Heaters

- (1) Read and understand the manufacturer's instructions relative to the type of heater installed in the trailer, and if these are missing, write for them immediately either to the manufacturer or to the Engineering Branch, B.C. Forest Service, Parliament Buildings, Victoria.
- (2) Use the greatest care when filling the oil tank at the back of the heater and wipe up any residue or spillage that may occur, taking care to destroy the wiping-cloth immediately as oily cloths are capable of spontaneous combustion. Paper towels are perhaps the best material to use as these are more readily disposable.
- (3) Always check by the heater after lighting to ensure it settles down to a steady flame.
- (4) Be sure to turn the heater down low before leaving the trailer. You may be away longer than you intend.
- (5) Precautions 3 and 4 apply equally to lanterns or Jamps.

10.224 Propane Gas

- (1) While safety features are built in to all propane gas fixtures in trailers, it is nevertheless very necessary to use common sense and presence of mind at all times when handling this fuel.
- (2) Be sure that the gas supply is turned off at the tank when leaving the trailer for any considerable length of time.
- (3) If you suspect that there is any leakage or escapement of gas from the tank, regulator, or safety valve, be sure to close any windows located within 3 feet of the tanks to prevent convection currents of air from drawing the gas into the trailer. (Escapement of gas from the safety valve may occur on a warm day if the tanks have been overfilled).
- (4) Do not look for leaks with a naked light.
- (5) When lighting the oven, do not open the oven gas control until you have a lighted match applied to the oven burner orifices.

For further details, see Appendix A.

10.225 Static Electricity

- (1) From time to time, persons have received slight shocks from touching the shell or door handles of trailers. This can be attributed to a number of causes, depending upon whether the source of electrical supply is grounded and whether this ground is located in the vicinity of the trailer. There are also several variables, such as the moisture content of the ground, which may affect the grounding qualities of the trailer's ground-rod, and of atmospheric dryness, which may cause static to collect in the aluminum of the trailer sheeting. The possible combinations of circumstances are so numerous that it is not possible to give precise instructions regarding the tracing of such conditions, but if the shocks are quite severe, the advice of an electrician should be sought at the earliest opportunity. One piece of advice can be given, however: if the type of connection permits, you should remove the plug and turn it 180 degrees before reconnecting and this may remove the cause of electrical "leakage" and consequent shocks.

10.23 SNOWMOBILES

10.231 Policy

- (1) Forest Service personnel shall observe the following

precautions while operating powered snow toboggans or other snow equipment generally referred to as snowmobiles.

10.232 Prior to Departure

- (1) Check the weather forecast.
- (2) Sign out, giving destination, route of travel, and estimated time of return.
- (3) Never travel alone unless the trip is to be short and safe. On long trips, two machines should be used.
- (4) Check general condition of machine.
 - a) Check spark plugs - two cycle engines are hard on plugs.
 - b) Check tracks and cleats for alignment, wear, breaks, etc.
 - c) Check the steering assembly for looseness or excessive tightness.
 - d) Check the condition and tension of drive belt.
 - e) Take a test drive.

10.233 Equipment Recommended for Snowmobiles

- (1) Correct and properly mixed fuel. An extra one-half gallon should be carried for emergency use.
- (2) A small can of gas-line antifreeze (methyl hydrate).
- (3) Extra spark plugs.
- (4) Small tools - two screwdrivers (one small, one large), vice-grip pliers, crescent wrench, and some small open-end wrenches.
- (5) A spare drive belt and spare starting rope.
- (6) A first-aid kit.
- (7) A single-bitted axe in sheath.
- (8) An operator's manual.
- (9) A flashlight (check batteries).
- (10) A small winch or "come-a-long" with sufficient rope or cable.
- (11) Other items such as friction tape, small roll of wire, assortment of small bolts may be needed on longer excursions.

- (12) If a trailing sled or toboggan is used, it should be connected to the snowmobile with a tow-bar and should be checked periodically during the trip.

10.234 Equipment Recommended for Crew

- (1) Snow shoes for each man - these are essential.
- (2) Water-proof matches.
- (3) Compass
- (4) Can of "sterno", a few cubes of firestarter or a large piece of candle.
- (5) A minimum amount of emergency food (cheese, hardtack, tea bags, dried fruit, dried soup, chocolate, etc.).
- (6) Adequate clothing. Heavy inner and outer clothing, preferably windproof. Heavy mitts and lined boots. A sock-type face mask and tinted ski goggles. Hard hat with chin-strap and liner.
- (7) Long trips and higher speeds should not be considered at temperatures below zero (centigrade).

10.235 Driving Techniques

- (1) When travelling on level ground, sit down.
- (2) On bumpy or steep ground, place one knee on the seat for better balance. Be prepared to shift from one side to the other.
- (3) If it is necessary to pass over ground which may be dangerous to the operator, passenger, or machine, snowshoe over the area first, pack it down, drop off the passenger until a return is made to safe ground. Avoid riding with the feet hanging over the edge. Remember that snowmobile brakes are not suitable for sudden stops. Don't be tempted to tie the throttle lever open. Don't make adjustments while the motor is running.
- (4) Don't overload the machine. Avoid "lugging" the engine. A two stroke is very vulnerable to burnt pistons and rings under these conditions.
- (5) Use common sense - don't engage in horseplay or take needless risks.

10.236 Snowmobile Operation

- (1) Different machines have different hazard characteristics.

Every operator should familiarize himself with the machine's controls and riding peculiarities before embarking on any trips.

- (2) Watch out for twigs, branches, windfalls, stumps, boulders and buried fences.
- (3) Watch also for ditches, gulleys, washouts, or other changes of slope. "White-out" or "flat light" can be very difficult and affect depth perception so slow down.
- (4) Do not venture onto lakes and rivers before checking ice conditions and travel slowly if in any doubt.
- (5) Exercise care in turning a machine by hand. The human body is subject to back and groin injuries under these circumstances.
- (6) Driving on roads or highways should be discouraged. A police permit is required for highway travel. A snowmobile can be a difficult object to see on a public road.
- (7) Avoid travel on railroad rights-of-way and exercise caution at railroad crossings. The snowmobile engine noise reduces chances of hearing approaching cars or trains.
- (8) Avoid travel in heavy timber, as the chances of being bogged down are increased. Use snowshoes. Jumping, snow rodding, and other forms of acrobatics will not be tolerated. Forest Service snowmobiles are for work and not for fun.
- (9) Travel at moderate speeds consistent with the terrain and snow conditions.
- (10) Snow toboggans are restricted to Official Use Only.

10.237 Towing or Hauling

- (1) Use care in loading and unloading procedures to prevent back and foot injuries.
- (2) Ensure that the load is properly tied down.
- (3) Ensure that the trailer is equipped with signal and running lights in good working order.

10.3 WATERCRAFT

Familiarize yourself with the current edition of Ministry of Transport publication "Safety Afloat".

10.31 GENERAL SAFETY REGULATIONS

- (1) Forest Service regulations require all personnel operating or being transported in open boats to wear an M.O.T. approved small vessel life-jacket.
- (2) Life-jackets shall be worn by personnel manning larger craft or when in the following situations:
 - a) when on deck during rough weather;
 - b) when traversing narrow catwalks;
 - c) when weighing anchor;
 - d) when going over the side to tie to boom-sticks, swifters, etc.; and
 - e) when transferring between ship and shore via small boat, log booms, etc.
- (3) Life-jackets, life-buoys and other life-saving gear shall not be used for any purpose other than their intended use. Unserviceable life-saving equipment shall be destroyed to prevent it from being used in error. Discarded safety equipment must be replaced immediately. Life-jackets must be kept dry during storage and dried after use to prevent rotting and mildewing.
- (4) The buoyant life-saving line must be in good condition and ready for instant use.
- (5) Fire extinguishers must be fully charged and of the correct type. Fire extinguishers of the vaporizing liquid type must not be used on vessels owing to the formation of toxic gases.
- (6) Smoking is prohibited in the engine room of any gasoline-powered vessel or at any time when a vessel is taking fuel on board.
- (7) Bottled gas must not be carried below decks or in any confined space. All propane appliances must be installed by a competent mechanic. Proper venting is a must.
- (8) Bilges must be kept clean, free of oil, gasoline and rags.
- (9) First aid kits must be carried by Forest Service watercraft in accordance with the First Aid Regulations of the Workers' Compensation Board of B.C.

- (10) Always head for the nearest safe anchorage or landing when a storm threatens.
- (11) Avoid all situations where a strong wind is bucking the current. This condition arises where a river flows into a bay or lake or where tidal current is flowing against the wind.
- (12) Respect your boat and know its limitations. Do not overload. Load and horsepower limits indicated by the safety plates fixed to the transoms of Forest Service outboard-powered boats shall not be exceeded for any reason. A safe margin well below the danger point, considering weather and other conditions, shall always be maintained.
- (13) Except in justifiable circumstances, which must be entered in the log book, Forest Service boats shall not be operated during the hours of darkness, in fog, other conditions of restricted visibility, or when weather conditions make operating hazardous.
- (14) Do not stand up in a small boat. If you must change position, crouch low and keep your weight on the centreline of the boat.
- (15) All boats shall be kept bailed to a minimum bilge content. Shifting bilge water can seriously affect the balance of a boat. Defects in automatic or other mechanical bailing gear should be reported immediately and repaired without delay.
- (16) Do not attempt to swim ashore if your boat is capsized or swamped. Hang on to the boat until you are picked up.
- (17) Learn the rules of the road and practise them. Keep a proper lookout and do not wait until the last minute to signify what action you intend to take in obeying the rules of the road.

10.32 OPERATORS

- (1) Boat operators are responsible for the daily maintenance of any craft, large or small, in their charge. Good maintenance is primarily routine inspection plus careful observation and quick action in dealing with defects as they arise.
- (2) Boat operators must be familiar with those sections of Chapter Five, Mechanical Equipment, which deal with the maintenance and operation of watercraft. Operators should also be familiar with manufacturer's recommendations issued with the engine of the craft in their charge.

- (3) For coastal work or on large lakes, boat operators must know how to read tide tables and/or charts and know elementary navigation techniques such as:
 - a) dead reckoning methods;
 - b) log-keeping; and
 - c) the effect of tide, current, and wind on the direction, speed and stability of the craft being operated.
- (4) It is the responsibility of supervisory staff to confirm that boat operators have sufficient knowledge and ability to operate safely a craft requiring the use of navigational aids.
- (5) All Forest Service watercraft operators must be conversant with the Canada Shipping Act, Regulations for Preventing Collision at Sea, detailed in the Ministry of Transport publication "Safety Afloat".
- (6) It is an offence to operate a vessel at a speed which may create a wash or wake dangerous to swimmers, small boats, float installations, etc., or in an anchorage or in water in which divers are working.
- (7) Personnel operating vessels equipped with anchors must learn various anchoring methods and become proficient in their application.
- (8) Boats with a built-in compass should have the compass swung at least once a year and after structural changes, particularly the relocation of engines, pumps, etc. Boat operators should check the compass at the beginning of each period of use, particularly if the idle period has been a long one.
- (9) Rapids and canyons should be navigated only by experienced men. When practicable, a thoroughly experienced riverman should be hired for tricky or dangerous navigation.
- (10) When operating any powerboat, including outboard-powered craft, make sure there is on board a proper, complete emergency motor repair kit which contains an adequate supply of tools and spare parts for the particular type of motor in use.

10.33 FUEL

- (1) While taking on fuel:
 - a) extinguish all fires and open-flame lights;
 - b) stop all motors;
 - c) do not smoke; and
 - d) close all portholes within 6 feet of filling intake.

- (2) Fuel tanks shall be filled in a manner which precludes fuel entering bilges or spilling on decks.
- (3) Gasoline or oil spilled into a bilge shall be removed immediately.
- (4) Lubricating oil shall not be drained into bilges during oil changes.
- (5) All fuel lines (gasoline, diesel, stove oil or gas) supplying motors, stoves, heaters, etc. shall be checked frequently for leaks. Any leak found must be repaired immediately.
- (6) Even if a closed vessel is in daily use, it shall when boarded be thoroughly ventilated or aired for at least 10 minutes before smoking, using a naked flame, using any electrical equipment or starting an auxiliary or main motor. Where a sealed bilge blower has been installed, it should be operated for at least five minutes in conjunction with ventilating.
- (7) Where propane or other open-flame burners are used for heating or cooking, adequate ventilation shall be provided at all times to ensure an ample supply of air for combustion and respiration. Standard Forest Service propane warning notices must be posted.
- (8) Propane or other gas cylinders shall be installed or stored on deck to allow vapour escaping from the safety valve to drain overboard rather than into the vessel.
- (9) Boats powered by gasoline engines shall not be equipped with a stove or any appliance using an open flame. Fire or explosion is likely in a following wind.
- (10) Rags or wiping-cloths impregnated with gasoline, paint, oil, turpentine, solvents, etc. shall not be stored on board Forest Service vessels, but shall be disposed, preferably by burning outside the vessel.

10.34 REASONS FOR BOAT SAFETY RULES

- (1) Maintenance - poor maintenance can leave you in an awkward, if not fatal, situation. Often the defects which cause the most trouble seem petty when the going is good.

The bilge you neglect to bail or pump out can seriously affect the stability of your craft in rough going. The water you forget to drain from the fuel-tank, or the fuel-filter you forget to clean can stall your motor when you most need it. Check everything and check carefully.

- (2) Load and horsepower limits - Forest Service watercraft have been powered with the following points in mind:
- a) economy, consistent with reliability and effectiveness;
 - b) ability to carry sufficient fuel for extended operation in areas devoid of fuel supply;
 - c) low weight of motor and fuel-supply to allow useful payload;
 - d) to permit the motor and fuel-supply to be manhandled on and off the boat in remote places lacking special facilities; and
 - e) speed control, for it should be realized that a fourfold increase in horsepower is required to double the speed.

Too great a speed with a speed hull can result in loss of control and capsizing. When too powerful a motor is used in a heavy hull, the stern is drawn down and safe freeboard is lost. In all cases, extra power means extra weight and lost carrying capacity.

- (3) Navigation - although a great deal of Forest Service marine navigation is of the point-to-point variety, operators should practise instrument navigation in preparation for possible emergency when visual navigation is not practicable. During normal runs a careful log should be kept of time, speed, tide and wind. Such details are invaluable in an emergency.

Operators should also know the meaning of chart symbols, location of obstructions, beacons, foghorns, buoys, etc. Because there is always the chance of error or omission in compiling a chart, operators should make their own careful observations in conjunction with chart consultation when operating in shallow or narrow waters.

An intimate knowledge of local weather characteristics is a prime requisite of safe navigation on large lakes and coastal waters.

- (4) Life-jackets - drowning is the leading cause of accidental death in the Forest Service. The majority of these deaths might have been prevented by the use of life-jackets.

Possession of life-saving equipment is not enough to ensure survival. Life-jackets must be worn. Life-saving equipment must be in good condition, and those likely to use it must have practised using it: there is not time to ask questions or read instructions while the boat is capsizing.

Even the strongest swimmers should remember that during an accident they may enter the water as an unconscious body, or that very cold water may sap their strength in a matter of moments. A life-jacket, properly worn, can be the difference between life or death.

- (5) Gasoline, propane, oil - anyone tempted to be careless with gasoline aboard a boat should bear in mind that the vapour released by one gallon of gasoline has an explosive potential equal to 450 pounds of TNT. Survivors of small craft explosions are few and far between.

Vapour from gasoline, propane, rock gas, etc. is heavier than air and settles in low areas. Therefore, it is possible to have a bilge full of high explosives and not realize it, yet one spark can blow you and the vessel to smithereens.

In a confined space, escaping propane, although non-poisonous, can cause death by anoxia (exclusion of oxygen) without exploding or burning. If allowed to escape in sufficient quantity, propane will fill a cabin from the bilge upward, pushing the air up and out, in the same manner as air is expelled from a bottle being slowly filled with water.

Oil, although much less volatile than gasoline, does burn fiercely once it is ignited; therefore, bilges should be kept oil-free.

Rags impregnated with paint, oil, turpentine, etc. can cause a fire by spontaneous combustion. Such material should not be left wadded in boxes or lockers, but should be destroyed.

Always wipe up spilled oil: oil and water on deck is a particularly slippery combination. Freshly painted decks, when wet, are exceptionally slippery unless non-slip paint is used.

10.4 AIRCRAFT

10.41 FLIGHT SAFETY

- (1) The pilot has the final word. He is responsible for the safety of the aircraft, occupants and cargo. He has complete authority to postpone, change or cancel his flight when he believes existing or impending conditions make it unsafe.
- (2) Before an aircraft departs, a written record of passengers and their destination or duration of flight must be left with responsible Forest Service ground personnel.
- (3) Flight plans for all flights carrying Forest Service personnel shall be filed in accordance with Ministry of Transport regulations. Radio reports of flight position must be made to Forest Service stations at recommended intervals.

- (4) While flying on Forest Service duty, in any aircraft other than scheduled passenger aircraft, personnel shall wear safety belts at the pilot's discretion.
- (5) Life-belts, as provided by airline companies under Ministry of Transport regulations, must be worn by Forest Service personnel flying in float planes.
- (6) Forest Service personnel are not permitted to fly in air tankers.
- (7) Personnel must not board or leave an aircraft without the permission of the pilot.
- (8) Smoking shall not be permitted during refuelling, take-off or landing. In flight, smoking will be permitted only with permission of the pilot.
- (9) Unless instructed by the pilot, personnel shall not assist during the securing or loading of aircraft - the risk of inexperienced personnel being struck by a propeller is too great.
- (10) All flights must carry an emergency food supply in addition to whatever other food may be carried. Emergency food must not be used until all other food supplies have been consumed.
- (11) Forest Service officers responsible for the charter of aircraft should make certain that the aircraft hired are adequate for the job and equipped in accordance with Ministry of Transport regulations for flying over unorganized territory.
- (12) Field parties to be left in an area accessible only by aircraft must be equipped with a radio and a schedule of contact times arranged. A break in the schedule, unless pre-arranged, will be construed as trouble and a flight will be made to investigate.
- (13) All passengers must have an approved seat and safety belt.

10.42

CARGO DROPS

- (1) Cargo droppers shall wear an approved harness, securely anchored to the aircraft, during dropping operations.
- (2) The cargo dropping hatch shall be closed immediately cargo dropping is completed.
- (3) A large, sharp sheath-knife must be kept handy during cargo dropping to cut fouled static lines.
- (4) "Free drops" are prohibited by Ministry of Transport regulations.

- (5) All personnel, domestic animals, vehicles and other equipment shall be cleared from the drop area prior to arrival of the aircraft. Danger zone is 200 feet wide on each side of the flight path of the aircraft, 300 feet in the direction of approach, and approximately 1,300 feet in the direction the aircraft leaves the target.
- (6) Alert, active lookouts shall be arranged for to observe where cargo is landing and to keep danger zone clear until the entire load has been dropped and the aircraft has left the target area. Have previously arranged signal for "all clear".
- (7) Keep personnel in vicinity of drop target spread out, preferably in open, away from dead or defective trees or snags that cargo might strike. Logs, brush, or steep hillsides which interfere with dodging dropped cargo should be avoided.

10.43

HELICOPTERS

- (1) Ground personnel shall keep at least 50 feet clear of helicopters (100 feet for large turbine machines) during take-off and landing, unless the pilot requests guidance, in which case one man will act as signalman and doing so will kneel or otherwise keep as low as possible.
- (2) Unless specifically instructed by the pilot to act otherwise, ground personnel shall remain well clear of the rotors while they are in motion. This applies both to main rotor and tail rotor.
- (3) Always approach or leave a helicopter from the front or side near the front where the pilot can see you. Never approach or leave a helicopter from any side where the ground is higher than the ground where the aircraft is standing or hovering. When leaving a helicopter, stoop-walk immediately away to the front or side toward the front until at least 50 feet from the rotor.
- (4) Keep helicopter landing areas clear of unauthorized personnel, equipment and all loose objects.
- (5) During loading and unloading of cargo, lashing material must be controlled in such a manner as to prevent it catching in moving parts of the machine. The pilot shall be fully responsible for the placing and securing of the load. When helicopter loads are carried in slings, the helicopter engineer shall be responsible for hooking on the load.
- (6) Forest Service officers responsible for the selection of helicopter landing sites should pick areas that are as dust-free as possible.

- (7) Where possible, personnel in the vicinity of a helicopter during landing or take-off should wear safety goggles.
- (8) Helicopter features to bear in mind:
 - a) Tail rotors, spinning at high speed, are almost invisible depending on light quality.
 - b) Rotors continue to revolve for some time after the motor has been shut off. As the main rotors slow down, they droop, leaving less clearance between their tips and the ground.
 - c) Main rotors pivot to allow see-saw action in addition to horizontal rotation and, because of this feature, a gust of wind can depress rotor blades enough to strike the unwary. This is particularly dangerous when a helicopter lands in a depression rather than on high ground.

10.44 AIRCRAFT PASSENGER ADVICE

- (1) Keep persons, clothing, maps and other equipment clear of exposed controls or control cables. Many crashes have been caused by loose objects jamming essential controls.
- (2) Do not talk to the pilot during landing or take-off, or at other times when he is obviously busy.
- (3) Keep alert for hazards and inform the pilot if any are noticed.
- (4) Personnel using aircraft should bear in mind that, compared to a car or truck, aircraft are relatively fragile. Always be careful to use only designated stepping places and hand-holds.
- (5) When flying in light fixed wing aircraft or helicopters, it is wise to wear a jacket and boots suitable for ground travel in case the aircraft is grounded and it is necessary to walk out or wait for rescue.

10.45 AIR EVACUATION OF INJURED

- (1) When requesting an aircraft, fixed wing or helicopter, to convey an injured person to hospital, be sure to supply the following information:
 - a) Description of the injury.
 - b) Has the injured person been moved since the accident occurred?
 - c) Has the injured person received first aid?
 - d) Is a doctor required to go with the rescue aircraft?

- e) Is a basket-type stretcher available, or must one be brought in by the aircraft?
- f) Is there an alternate method of transporting the injured person, and if an aircraft is not immediately available, will the alternate method be used?
- g) Give the location of the pick-up point in detail and mark it distinctly so the pilot will have no trouble in finding it.

10.46 FIRE RETARDANT AIR DROPS

- (1) Personnel can be injured by the impact of retardant slurry dropped by low-flying aircraft. Clear men out of target area when the retardant drop is to be made. If an individual is unable to retreat to a safe place, the safest procedure is to:
 - a) Lie face down, with head toward oncoming aircraft and hardhat in place.
 - b) Discard hand tools to the side of, behind and downhill from the body.
 - c) When lying on the ground, grasp something firm to prevent being carried or rolled about by the dropped liquid.
 - d) Do not run unless escape is ensured.
 - e) When in timber, get clear of dead snags, tops and limbs in drop area. Do not remain in the area if there are rocks or other material that may be dislodged by the liquid drop.
- (2) No drops will be made over live power lines. In some cases it may be advisable to make prior arrangements with electric power authorities to de-energize powerlines when it is necessary to apply retardant in the immediate vicinity of these lines.
 - a) All personnel must be at least 200 feet from all types of powerlines during the dropping of retardant, unless the power has been turned off.
 - b) Personnel should not be under poles, towers or wires during drops because of the danger of breakage and falling debris.

10.5 FOREST FIREFIGHTING

10.51 FOREST SERVICE OFFICER RESPONSIBILITY

- (1) The responsibility for screening out men of unsuitable

physique, or those unsuitably clad or shod, rests with all Forest Service officers directly concerned with the hiring and dispatching of men for fireline duty. No personnel should be assigned to firefighting duty if they have any medical or physical problems.

- (2) Whoever is in charge of a group of firefighters must be positively identified to the crew and his authority to issue orders must be made clear. All instructions and orders must be clear, concise and must be repeated, if necessary, until they are fully understood.
- (3) On the fireline, those in charge of fire crews shall be responsible for crew safety. Firefighters shall be instructed on area hazards and safe working practices before they start work.
- (4) Escape routes should be planned in advance to prevent men or machinery being trapped in a blow-up. Escape routes should be marked so there will be no mistakes if an emergency does arise. Firefighters shall be thoroughly instructed on escape route use.
- (5) Where necessary, lookouts or spotters shall be posted to watch for and give warning of blow-ups, rolling rocks or logs, falling trees, etc. Those in charge of crews must maintain close contact with crew members to avoid dangerous scattering of men. Small groups are most easily managed and contribute to safe and more efficient firefighting. Men should not be allowed to work alone.
- (6) Care must be taken to ensure that firefighters do not get trapped between a fast-growing spot fire and the main line.
- (7) Only snag-fallers and guards should be allowed in a snag-falling area. When snags are to be felled close to a fire, a guard should be posted to warn snag-fallers of any danger and to keep others clear of the area.
- (8) Immediately after a blow-up, or fall of rocks, trees or snags, etc., a check shall be made to ensure that all men are safe. The "buddy system" works well in this regard and should be used whenever possible. (The "buddy system" means making one man responsible for another man - i.e. if asked, one man should be able to account for the whereabouts of the other).
- (9) An injured person shall be given appropriate priority and shall be given the benefit of every facility available, regardless of the fire situation. Prompt first aid shall be given for all injuries, especially for bleeding, burns and shock.

- (10) As required by Workers' Compensation Board, a qualified man must be assigned as soon as possible to the checking of safety measures, and first-aid, sanitation and health facilities.
- (11) Reasonable rest periods must be given, especially during hot days and when crews are working at high altitudes. No man should be expected to work more than 12 hours and, after a 12-hour shift, must have at least eight hours rest. Men who have worked for long periods without adequate rest become inefficient and accident-prone.
- (12) Resting, eating and sleeping areas shall be designated at a safe location some distance from the fire, falling trees or snags and machinery. If necessary, a guard should be posted over these potential problem sites to provide warning of danger. Sleeping is to be permitted only in designated areas and never on firelines.
- (13) Night crews or night patrols should be used only in cases of dire necessity, and never when there is danger of men being struck by falling snags, rolling rocks, etc. or a possibility of men falling over cliffs.
- (14) If night bush travel or night patrols are necessary, crewmen shall be issued with adequate lights.
- (15) Whenever electrical powerlines are involved in a fire, special care shall be taken to keep crewmen out of danger of electrocution. All men should be cautioned against directing water streams into high-tension wires.
- (16) Visitors must not be permitted on any fireline for any reason unless accompanied by a Forest Service officer or other responsible person designated by the Forest Officer in charge.
- (17) Trucks, cars, tankers and other equipment parked for the night on a road likely to be travelled by other vehicles or equipment shall be marked by flares, red lights, etc.
- (18) Where a forest fire involves a road other than one used exclusively for fire access, signs shall be posted to warn travellers to proceed slowly and watch for men and equipment.

10.52

SAFE FIREFIGHTING PRACTICES

- (1) Keep calm when faced with a dangerous situation. Panic leads to trouble. Keep a clear mind and act with cold, deliberate logic.
- (2) Obey instructions, particularly those pertaining to safety and emergency action.

- (3) At all times watch out for fast runs of fire in any direction, particularly uphill.
- (4) Firefighters should never try to outrun the head of a fast-running fire. Try to get to the flanks. At times the safest escape route is into the burned area.
- (5) If surrounded or cut off by fire, these emergency procedures should be followed:
 - a) Follow crew boss's instructions. Keep fire tools and stay together.
 - b) Move to barren area. If area is flat, dig in as much as possible. On ridge top, keep on opposite side of fire.
 - c) On road, lie down - inside cut bank if possible. Keep face buried in arms.
 - d) In all cases, protect face and head areas - cover face with wet handkerchief. Keep canteens or dirt ready to put out sparks on clothing. Shield lungs against hot gases.
- (6) Stay clear of heavy equipment on firelines - at least 100 feet is suggested. Do not depend upon the equipment operator to see you or keep away from you. Men or machines shall not work directly above one another or at close intervals when working on steep slopes.
- (7) Observe the following rules for clothing and protective equipment:
 - a) Wear safety hat while on the fireline. All visitors to the fireline are also required to wear safety hats.
 - b) Wear laced leather boots with slip-resistant soles.
 - c) Firefighters not equipped with flame-resistant clothing should have durable, loose-fitting trousers and shirts. Long-sleeved shirts are mandatory to protect the arms from heat, sunburn, scratches and insects.
 - d) Gloves should be worn to protect hand and make handwork easier.
- (8) When scouting or working ahead of a crew in brushy terrain, carry a cutting tool and clear all vegetation which might hamper escape.
- (9) All firefighters shall be alert to the action of a fire. In fast-burning fuels, fire-runs can occur in any direction but especially uphill. Slopes can become explosive at any time under adverse weather conditions. Where possible, the safest place to fight a fire is on the flanks. From there, a firefighter can usually retreat into the burned area.

10.53 DANGEROUS FIRE SITUATIONS

- (1) The following are fire situations that shout "watch out!":
 - a) You are building line downhill toward a fire.
 - b) You are fighting a fire on a hillside where rolling material can ignite fuel below you.
 - c) You notice a wind beginning to blow, or increase or change direction.
 - d) You notice the weather getting hotter and drier.
 - e) You are on a line in heavy cover with unburned fuel between you and the fire.
 - f) You are away from the burned area where terrain and/or cover makes the travel difficult and slow.
 - g) You are in country you have not seen in daylight.
 - h) You are in an area where you are unfamiliar with local factors influencing fire behavior.
 - i) You are attempting a frontal assault on a fire with tankers.
 - j) You are getting frequent spot fires over your line.
 - k) You cannot see the main fire and you are not in communication with anyone who can.

10.6 HAND TOOLS

10.61 GENERAL

- (1) Observe these guiding principles when using tools:
 - a) Select the right tools for the job.
 - b) Maintain tools in good condition.
 - c) Use the proper tools correctly.
 - d) Keep tools in a safe place, both on the job and in storage.
- (2) Guard or sheath sharp-edged tools when they are not in use or during transportation.
- (3) Carry hand tools so that they can be thrown clear if you fall. On a hillside, carry the hand tool on the downside of the body.
- (4) Never throw a hand tool to a fellow workman - always pass it carefully, handle first. Never throw hand tools from a vehicle when unloading.

- (5) When they are not in use, place tools against a wall, bank or stump or lay down in plain sight, with sharp edges down. Never leave tools where they can be walked on or tripped over.
- (6) Construct racks and bins for tools so that men cannot fall on or collide with sharp edges and so that tools cannot fall out.
- (7) Inspect tools for proper condition before use or storage.
- (8) Be sure to have firm, balanced footing when using any hand tool. A high percentage of accidents to Forest Service personnel are the result of insecure footing.
- (9) Use special care when working on a hillside.

10.62 CHOPPING TOOLS

(This includes such tools as axes, adzes, planting mattocks, brush hooks, hatchets, machetes and Pulaskis).

- (1) Be sure to have, or make, ample swinging room for axes, etc., and always be sure that fellow workmen are well clear before swinging.
- (2) Whenever possible, chop away from legs, feet and body. If it is necessary to chop toward any part of the body, strike light blows that can be controlled.
- (3) Remove underbrush and overhead branches that might interfere with chopping.
- (4) When chopping limbs from a felled tree, stand on opposite side of trunk from the limb being chopped.
- (5) Two men shall not chop together on the same tree.
- (6) Guard against chips hitting the eyes.
- (7) When standing on logs, chop only if equipped with non-skid or caulked boots.
- (8) Special foot protection such as non-skid, safety-toed boots should be used on chopping jobs.
- (9) Repair loose-handled tools promptly.
- (10) Keep cutting edges sharp and respect the cutting edge. Generally speaking, a sharp tool is safer than a blunt one because it works more efficiently.

- (11) Place tools in a secure position when filing. The hands must be protected by gloves and/or a file guard to prevent cuts if the file slips. All files must be fitted with a handle before use.
- (12) Goggles or safety glasses must be worn when using a carborundum wheel.

10.63 POWER CHAIN SAWS

See Fallers' and Buckers' Handbook, W.C.B. of British Columbia.

- (1) The following safety rules should be observed in the use of power chain saws:
 - a) Always wear approved leg guards and ear protective equipment.
 - b) Maintain the saw so that when it is idling the chain is stopped.
 - c) Check the saw frequently to ensure all parts are tight and the chain is properly adjusted.
 - d) Keep the chain bar to the rear when carrying the saw. If you stumble you will not fall on the chain and the dogs and chain will not hang up in brush.
 - e) Shut the motor off when carrying the saw any distance.
 - f) Use caution around the cutting chain and hot exhaust manifold when servicing the machine or filing the chain.
 - g) Hold the saw firmly against the body when using the saw in the boring position to reduce impact from kickbacks.
 - h) When sawing limbs, remember the end bar causes most kickbacks.
 - i) Learn to use the saw equally well, right-or-left-handed, to avoid working in awkward positions.
 - j) Never stand directly behind the saw, and never straddle the saw. Stand to one side to minimize injury from potential kickbacks.
 - k) Be sure to have firm footing. Reports of power saw accidents in the Forest Service indicate that insecure footing is the major cause of power saw injuries.
 - l) Other than necessary needle-valve adjustments, no other adjustments should be made to a power saw while it is running. Stop the motor for all other adjustments, and for cleaning and repair of the saw or motor.
 - m) Stop motor if saw becomes pinched or wedged. A stalled or stopped power saw should be removed from the cut before it is restarted.

- n) Before cutting a tree or log, clear away any brush or debris that might foul the chain. Do not cut brush with a power chain saw - use a special brush-cutting attachment.
- (2) Saw kickbacks cause many injuries. They result from the operator losing control of the saw. This occurs when:
 - a) Working in an awkward position, working off balance or working with poor footing.
 - b) The saw touches branches, obstructions or other materials.
 - c) Saw mechanical problems exist such as improperly filed chain, loose handle bars, clutch drag, or improperly adjusted idle speed.
 - d) The saw binds in the back-cut kerf because, for example, a wedge was not used.
 - (3) When refuelling a power saw, observe the following fire prevention precautions:
 - a) Do not refuel with the motor running. Allow the motor to cool for two or three minutes.
 - b) Refuel the saw only at a spot cleared to bare ground.
 - c) Clean spilled gas and oil from the motor before starting.
 - d) Check fuel lines, fuel cap and connections for gas leaks.
 - e) Move the saw at least 10 feet from the fueling area before starting.
 - f) Do not operate the saw if it is backfiring.
 - g) Clean carbon from muffler periodically and check the muffler once a week.
 - h) Store fuel in approved containers.

10.64

POWER MOWERS

- (1) Before using a power mower, inspect the area to be cut and remove stones, wire, glass or any other debris. Any material other than grass may be thrown out with great force causing serious injury to the operator or bystanders.
- (2) Never allow children or other persons near a power mower in operation.
- (3) Other than necessary needle-valve or throttle adjustments, no other adjustment should be made to a power mower while the motor is running.

- (4) Keep hands and feet well clear of the cutter blades while they are in motion. Stop the motor if it is necessary to clean any part.
- (5) When cleaning the underside of rotary mowers, the blades should not be revolved by hand without ensuring that the ignition switch is off. If the mower is not fitted with an ignition switch, the spark-plug wire should be disconnected.

10.65 PORTABLE POWER PUMPS

- (1) Never fuel a pump while it is running. Wipe up spilled fuel before restarting engine.
- (2) Other than necessary needle-valve, throttle, water-flow or grease-cup adjustments, no other adjustments should be made to a pump while it is running.
- (3) Water under pressure, particularly from high-pressure pumping units, shall not be directed at or near personnel.
- (4) Be sure pumps are located away from dangerous snags, trees, rocks or heavy equipment. Bear in mind that motor noise prevents the pump operator from hearing danger.
- (5) When a heavy pump is being skidded down a steep stream-bank, it should be restrained by a rope, snubbed around a suitable anchor.

10.7 BUSHCRAFT

Refer to B.C.F.S. publication "Wilderness Survival".

10.71 GENERAL

- (1) Before you enter the bush, always tell someone where you are going and how long you expect to be out. Many Ranger Stations use a "booking out" board on which personnel note where they will be working and when they expect to return.
- (2) Whenever possible, avoid going into the bush alone, especially on long trips.
- (3) Carry a map of the area you will be in and memorize the main features (relief and drainage pattern) of an area well beyond the confines of the large-scale map carried.

- (4) Carry emergency rations, waterproof matches, insect repellent, some sure-fire kindling (wax-impregnated cloth or paper, candle, pitch-sticks, etc.), first-aid kit, whistle, compass, belt axe and knife. Carry a flashlight when night travel is contemplated. Carry a snake-bite kit in rattlesnake country. Use lanyards to fasten matches and compass securely to your person.
- (5) Wear clothing and boots suitable for the weather and terrain. Wear cuffless trousers and leather gloves for all field work.
- (6) Make a point of finding out which trees and plants yield food - there are many (see B.C. Museum publication "Fifty Edible Plants of British Columbia").
- (7) Exercise judgement:
 - a) Choose safe travel routes and stream crossings.
 - b) Make sure of secure footing and safe working positions. Watch your step. Rocky slopes, especially slide rock and steep country, are treacherous. Have one hand free, preferably on the uphill side, for protection against falls or obstructions.
 - c) Walk, do not run down slopes.
 - d) Avoid travelling or camping in snag areas during windy weather. Choose campsites in areas free of unsound trees, limbs, and steep ground where rocks may roll from above.
 - e) Always be on guard against injury from falling trees, snags, limbs, rolling logs or rocks. Do not run blindly if a rolling rock, log or tree is heard. Determine the direction of fall, then get out of the path.
 - f) When walking single file through brush, walk sufficiently separated to avoid slaps from brush, branches, etc. which might cause an eye injury.
 - g) Be sure other workers know where you are working.
- (8) For more detailed information on bushcraft, see the Forest Service publication "Wilderness Survival".

10.72

COLD WEATHER TRAVEL

- (1) Keep warm, but do not work up a sweat. Damp clothing conducts the cold. If wet, get dried out as soon as possible. The colder the weather, the more urgent it is to get dry. Change clothing, if possible; if not, light a fire, strip and dry out.

- (2) The key to warmth is insulation. This is achieved by wearing several layers of light, loose, fluffy material. A windproof outer layer is necessary to preserve the warm air within the insulating layers.
- (3) Watch for frost-bite. The first sign of frost-bite is a loss of feeling and paleness of the flesh. Severe frost-bite cases must be hospitalized, but less severe cases may be treated with gentle warmth not greater than body heat. The following are some heat sources:
- a) Warm hand - for thawing a frozen ear or part of the face.
 - b) Inside clothing next to the skin - for thawing a hand.
 - c) Inside companion's clothing - for thawing a foot.
 - d) In bed, at normal room temperature.
- Do not rub frost-bite. Never apply snow to frost-bite. Do not try to thaw by exercising as this will increase tissue damage and is likely to break the skin.
- (4) Be cautious when travelling on ice:
- a) Several persons travelling on ice should not bunch up but should walk in single file, well separated. If the ice does give way, it is more likely someone will remain safe and dry to assist in rescue.
 - b) At least the lead man should carry a pole to test for weak spots. A pole, if carried horizontally, will sometimes prevent complete immersion by catching across the hole.
 - c) If a member of a party does go through the ice, his companions should lie on the ice when approaching the weak area. Lying on ice distributes the weight and lessens the risk of breaking more ice. A pole can also be used to distribute a person's weight when crawling on the ice and can be extended to the person who has fallen through.
 - d) Getting out of the water is often most easily done by working backwards to the edge of the ice, hooking the elbows over the ice and raising the body until the upper half is supported, then drawing up or heaving the legs onto the ice. Once out of the water, remain prone until away from the edge of the hole and on solid ice.
 - e) Once rescued, the person should be warmed and dried as soon as possible. Do not delay doing this by trying to get him to camp or home if the distance is great. Rolling in snow helps draw water from clothing.
- (5) When travelling in snowslide areas:
- a) Avoid hazardous areas. In the spring, snowslide hazards are extreme after 3 days of unusually hot weather.

- b) Stay out of steep country for approximately 48 hours after heavy snowstorms or until the new snow bonds with the old.
- c) In the spring or during periods of heavy thawing, arrange to travel over steep snow areas during the early morning hours because wet snow avalanche hazard increases greatly after 12 noon.

10.73 GETTING LOST

- (1) When lost, keep calm. Being lost simply means being uncertain of one's present location in relation to some known point. Do not walk aimlessly. Trust your map and compass. Remember shelter and warmth are more important than food.
- (2) Try to think your way out of the situation:
 - a) Listen for familiar sounds that may guide you out.
 - b) Climb to where you can see surrounding country to orient yourself.
 - c) When you reach a road, trail or telephone line, follow it. As another resort, follow a stream downhill.
- (3) If you decide you are truly lost:
 - a) Shout, blow a whistle or make a loud noise if you have been one of a party and have recently been separated from the group.
 - b) Make up your mind to stay in one place (near water, if possible) and wait for the search party.
 - c) Select a sheltered spot and prepare camp, shelter and firewood before dark.
 - d) Light three fires in a triangular pattern, spaced 90 feet apart (a recognized lost signal) in a clearing if possible. During daytime, make thick smoke, especially if an aircraft is in the vicinity. During the night, make flames at intervals, particularly if an aircraft is heard.
 - e) Conserve food and energy as much as possible, but keep busy at some task to occupy your mind.
- (4) If you injure yourself, the first thing to do is stop any bleeding. If your injuries immobilize you, make yourself as comfortable as possible to wait for the search party. If you are not completely immobilized but are unable to walk out, do all you can to follow the procedures outlined in 3 (a) to (e) of this section.
- (5) Remember starvation is not imminent. You will be able to survive for several weeks without food, but only a

few days without water. Drink plenty of water, it will keep your body from poisoning itself with waste products and prevent the weakening effect of dehydration. There are many sources of food in the bush:

- a) All birds, animals and fish are edible, cooked or raw.
 - b) New shoots of trees, shrubs and plants (except water hemlock and some mushrooms which are very poisonous). Boil or eat raw as greens.
 - c) Inner bark of lodgepole pine, birch, poplar, willow and alder. Eat raw or cooked.
 - d) Many berries such as salmonberries, salal, huckleberries, blueberries, blackberries, raspberries, rose-hips, etc. are edible.
- (6) If you do not have a compass, the sun and the stars provide reliable methods of finding directions:
- a) Using the North Star (Polaris) is one of the easiest methods. To find the North Star, use the Big Dipper Constellation, having found it, simply face it and you are facing north. You also can use a pole, sighting along it then lowering it to the ground, keeping it lined up with the North Star. You then can use the pole in the morning as a north-south indicator.
 - b) The sun is the daytime indicator. The sun moves 15 degrees per hour - at 6 a.m. Standard Time it is close to due east, at 12 noon it is due south, and at 6 p.m. it is close to due west.
 - c) By using your watch in conjunction with the sun you can obtain a reasonably accurate direction, although the method is a little more complicated. First, by orienting your watch, point the hour hand directly at the sun; then, by bisecting the angle between the hour hand and 12 o'clock, you have an imaginary line running north and south.

10.8 BUILDINGS

10.81 OFFICES

- (1) Provide sufficient lighting in storerooms, halls and offices so that all normal hazards can be seen and avoided.
- (2) Keep aisles, halls and stairways clear of objects. Place extension cords for electrical equipment and telephones where they are not tripping hazards. Do not leave litter or loose equipment on the floor to cause slips and trips. Close file drawers when not in use.

- (3) Place electric fans, paper cutters and other hazardous equipment so that they are not a hazard.
- (4) Ensure proper stowage of materials on shelves. Materials should not be stored on top of file cabinets, bookcases, etc. Keep windowsills and ledges free of loose objects.
- (5) Learn the correct way to lift weighty objects. ("Lift with your legs"). When in doubt, get assistance.
- (6) Use ladders to reach top shelves instead of using makeshifts such as chairs or boxes.
- (7) When sitting in chairs, keep all four feet of the chair on the floor. This will prevent overbalancing and causing head injuries, etc.
- (8) Use caution when opening or closing drawers, doors or windows, etc.
- (9) Bottom drawers in file cabinets should carry the heaviest loads. Have only one drawer open at a time.
- (10) Provide adequate ventilation and avoid skin contact when dealing with such substances as reproduction or cleaning fluids.
- (11) Do not attempt to repair defective wiring or electrical equipment without proper knowledge.
- (12) Make sure matches, cigarettes, cigars and pipe dottle are out before disposing of them. Do not use wastepaper baskets as ash trays.
- (13) Keep an approved, fully stocked first aid kit on hand for emergencies.
- (14) Broken glass should be wrapped, marked and put aside (not in wastepaper baskets) for the janitor.
- (15) Extra precautions should be taken in disposing of fluorescent tubes to prevent accidental breakage.
- (16) Regular paper fasteners should be used - never pins. Razor blades and pins should be kept in containers, never loose in desks or thrown into wastepaper baskets.

10.82

WAREHOUSE AND OTHER STORAGE AREAS

- (1) Adequate lighting in all work areas is essential for safety.
- (2) Maintain neatness and orderliness at all times.

- (3) Piling instructions:
- a) Observe safe floor load limits.
 - b) Provide each pile with a firm foundation. Block round objects so they cannot roll.
 - c) Cross-pile tiers so that materials support each other is possible.
 - d) Interlock insecure stacks of material with boards or other materials.
 - e) Pile material only high enough for safe lifting, handling and storage. Lean material away from aisles to prevent toppling.
- (4) Keep all stairways, aisles, floors, working spaces, platforms and exits free from defects, rubbish, slippery substances, loose material or obstructions that might cause falls or slips.
- (5) Make sure there is a proper place for storing all tools and equipment and see they are returned there after use.
- (6) Place grease, oil or paint rags, excelsior, paper or other flammable material only in metal receptacles which should be emptied frequently. Wet excelsior and similar fibrous packing is prone to spontaneous combustion and should be removed from the warehouse immediately.
- (7) No substitute should be used for a strong step-ladder or set of steps for reaching high storage areas. Climbing on shelves, using boxes or other insecure support is unsafe.
- (8) A freight barrow or dolly should be used to move heavy loads.
- (9) When a hoist is used, the load shall be secure and workers shall be out from under the load before it is lifted. Light trucks and other mechanical lifting devices shall be operated only by authorized personnel.
- (10) Proper and careful lifting techniques, using leg muscles, must be used when lifting heavy objects. Leg muscles are less likely to be strained than back muscles. Heavy articles should not be lifted with the back fully bent. Posters showing correct lifting techniques should be prominently displayed.
- (11) Ask for help if the load is heavy. Employees shall not try to lift beyond their strength.
- (12) Safety hats will be worn wherever there is an overhead hazard.

- (13) Low beams and projections should be marked by flags or paint.
- (14) Floor areas below hatches should be clearly outlined and marked as danger areas. Hatch covers should be clearly outlined and marked "No Step". Hatches must be kept closed when not in use.
- (15) Gloves should be worn when handling heavy, rough or sharp-cornered objects.
- (16) The wearing of boots or shoes with safety toes is advisable and may be mandatory in some circumstances.
- (17) Watch for pinch points, splinters, splinters and projecting nails.

10.83

WORKSHOPS AND GARAGES

- (1) Machinery and equipment shall be equipped with approved guards which provide adequate protection for workmen.
- (2) The cleaning, oiling or adjusting of moving machinery is prohibited.
- (3) Use sticks or brushes to remove particles, metal cuttings, chips or dirt from machines - never use the hands.
- (4) There shall be clear, adequate aisle and working space around machines, maintained in a non-slippery condition. Any spilled oil or grease will be wiped up promptly or absorbed by sawdust or sand which will be swept up.
- (5) Before starting any power-driven machine, the operator shall check to see that:
 - a) The working surface is clear.
 - b) Guard and safety devices are adjusted and in place.
 - c) All parts, such as cutting tools, tool holders, chucks, centers, guides and clamps, are properly adjusted for the job to be done and are set to clear all moving parts.
 - d) The machine is in safe operating condition, with all parts operating freely.
 - e) If power machinery stops unexpectedly, turn all control switches to "off" position before investigating the cause of the stoppage.
- (6) Grinding wheels should be shielded to deflect flying particles, and the operator will wear goggles or a safety shield.

- (7) All heavy machine parts or heavy equipment should be lifted by hoist or jack to avoid strained muscles and back injuries.
- (8) Safety stands or blocks must be used in conjunction with hoisting and jacking up equipment when personnel must work underneath.
- (9) Fingers, hands, feet and arms should be kept clear while aligning heavy machine parts.
- (10) Shut off power machinery when not in use. The operator will remain at the machine until all moving parts have come to a full stop.
- (11) Care should be exercised while using compressed air. Compressed air should be stored at the lowest possible effective pressure. Protect air hoses from being run over. Wear goggles or other eye protection at all times while using compressed air equipment.
- (12) Oxygen must not be directed into or on to clothing, nor used as a pressure blast in place of compressed air. Fire or explosion can readily result from misuse of oxygen. All oxygen equipment must be kept oil and grease free.
- (13) Carbon monoxide gas is odorless, colorless and tasteless. It is a deadly poison. To avoid carbon monoxide poisoning, adequate ventilation must be provided in any building housing an internal combustion engine which is run for test or other purposes. When necessary, leak-free flexible tubing should be attached to exhaust pipes to carry fumes outside.
- (14) Open flames or sparks should be kept away from batteries, all of which generate an inflammable and explosive gas. Battery acid can cause severe skin burns as well as destroy clothing and other fabrics.
- (15) Electrical cords to power tools and trouble lights should be kept in good condition. By short circuiting, a damaged electrical cord can cause a fire or electrocution. Ground all electric tools.
- (16) Keep grease pits free of oil, grease, rags and fumes. Provide pits with rails or a cover, whether indoors or outdoors.
- (17) Use only "flash point" or non-inflammable cleaning fluids. Never use gasoline for cleaning. All cleaning fluids should be used with discretion, some cause skin irritation. Ensure adequate ventilation, carbon tetrachloride gives off poisonous fumes at normal temperatures and generates phosgene gas when used.

- (18) Welding equipment is a fire hazard when carelessly used. Take every precaution to prevent sparks from landing on inflammable material. All oxy-acetylene equipment will be equipped with anti-blowback valves.
- (19) If possible, avoid welding or soldering gasoline tanks. When welding or soldering is unavoidable, do the job outdoors and fill the tank with water. A low melting point solder is recommended for use on gasoline tanks.
- (20) Garages and workshops must be equipped with fire extinguishers suitable for extinguishing oil and electrical fires.
- (21) Workshop and garage employees will wear boots or shoes with safety toes.
- (22) Before using any chemical preservatives, lacquer or other toxic substance, workmen will familiarize themselves with the safe handling instructions specific to the substance involved. When in doubt as to the toxicity or the safest method for handling such substances, consult the manufacturer's instructions or the W.C.B. inspector at the nearest local office. If satisfactory information remains unavailable, contact the W.C.B. Industrial Hygiene Department, 4211 Kingsway Avenue, Burnaby, British Columbia.

10.84 LOOKOUTS

- (1) A lookout man should accompany any visitors during their tour of the installation to ensure their safety. Visitors must not be allowed to climb lookout buildings except by stairways provided. Both the lookout man and visitors should observe the following precautions:
 - a) Use the handrails provided on stairways.
 - b) Avoid climbing steep stairways without one free hand.
 - c) Keep trap-doors closed while not actually in use.
 - d) Do not drop objects from lookout windows, ladders, stairways, etc.
- (2) Do not climb on lookout structures during maintenance work, etc. without adequate ladders, scaffolding, safety rope or safety belt.
- (3) All lookouts must be equipped with a fire extinguisher suitable for suppressing grease and oil or electrical fires.

- (4) All lookouts must be equipped with lightning arresters well grounded in damp soil or to a large piece of metal or to wire netting spread out and pegged to the ground. Lightning arrester spikes must project above the highest part of the building or anything attached to the building. Lightning arrester connections must be undone, cleaned and reassembled twice per season. Grounding areas should be checked weekly. Water poured on the grounding areas helps keep them effective.
- (5) All heavy metal equipment - stove, fire-finder, radios, etc. must be grounded. Private radio sets must also be grounded.
- (6) Antenna and telephone lead-ins and powerlines must be disconnected from their respective instruments and grounded during a lightning storm. Antenna lead-ins and powerlines must be far enough apart to prevent lightning from arcing between them.
- (7) Fuel tanks must be outside lookout buildings and must be grounded.
- (8) Lookouts which have stairs or ladders as a means of access should be checked at least twice a year by a qualified person to ensure that all stringers, steps and risers are securely fastened.
- (9) If for any reason a lookout man finds it necessary to leave the area of the lookout while alone, he should check in by radio with the ranger station and report his destination and estimated time of return, and report his return upon arrival back at the lookout site.

10.9 COMMUNICATIONS AND ELECTRICITY

10.91 GENERAL REQUIREMENTS

- (1) Treat all powerlines, circuits and electrical equipment as dangerous.
- (2) All electrical installations, power lines, equipment, apparatus and appliances shall be in conformity with the requirements of the "Electrical Energy Inspection Act" and regulations made pursuant thereto. (See also Section 22 of the Workers' Compensation Board "Accident Prevention Regulations").
- (3) Subject to paragraph (4) of this sub-section, only workmen experienced in working on electrical lines and equipment shall be authorized to do such work.

- (4) Other workmen may be permitted to carry out minor work on electrical lines or equipment at a potential not greater than 150 volts to ground, provided they have been adequately instructed and are under the direction and supervision of a person experienced and competent in the type of work being performed.
- (5)* Observe the following precautions:
 - a) Avoid overloading power service with additional equipment.
 - b) Do not overload electrical receptacles by using multi-plug arrangements.
 - c) Keep cords clear of aisles and travelled areas.
 - d) Do not use electrical equipment or activated circuits in wet areas or if hands are wet.
 - e) Ground all portable electrical tools.
 - f) Do not use electrical tools or other equipment where there are flammable vapours or gases.
 - g) Be aware of static electricity when transporting large amounts of flammable liquids or powders.
- (6) All electrical circuits with outlets from which electrically driven motors or tools may be operated are fitted with either manual or automatic reset circuit breakers or overload switches. These breakers may on occasion, and for a variety of causes, be tripped and thus disconnect the current from the motor or tool being used.
 - a) If the power supply fails, switches on tools or machinery should immediately be placed in the "off" position.
 - b) If this is not done, resumption of power or resetting of the circuit breaker may take the operator or some other person by surprise and lead to an injury.
- (7) Loose wires hanging from buildings or poles shall not be touched until you are certain they are not connected to a live source of electricity.
- (8) Do not trust insulation on live wires.
- (9) Correct damaged or defective wiring outlets, fixtures, connections and switches upon discovery, or put out of service until proper repairs are made.
- (10) Pull switch before cartridge-type fuses are removed or replaced. Do not use larger fuses than appropriate for the circuit wire.
- (11) Use of extension cords shall be subject to the following restrictions:

- a) Disconnect by pulling the plug, not the cord.
 - b) Replace when worn, frayed or brittle.
 - c) Store cords in a cool, clean, dry place where they can lie loosely coiled.
 - d) Do not allow cords to become kinked or come in contact with oil, grease or chemicals.
 - e) Cords should not be inserted through walls unless correctly insulated wire is used.
- (12) Treat all powerlines as dangerous:
- a) No material shall be piled, stored or handled, no scaffold erected or dismantled, no equipment operated within 10 feet of any energized electrical conductor capable of energizing the material or equipment unless workmen are protected by application of provisions of the regulations contained in Section 24 of the Workers' Compensation Board "Accident Prevention Regulations".
 - b) When the electrical conductors are high-voltage transmission lines which might require a greater clearance than 10 feet the employer shall be responsible for:
 - i. ascertaining the voltage and minimum clearance distance required;
 - ii. maintaining the minimum clearance distance;
 - iii. ensuring that no material or equipment is allowed to be handled or operated within the minimum distance specified.

This regulation does not apply to qualified electrical workers using safe work procedures specified by an authority acceptable to the Workers' Compensation Board.
- (13) Before a power crane, power shovel or other large equipment is operated in the vicinity of any overhead conductor, a permit to operate such equipment will first be obtained from B.C. Hydro in compliance with W.C.B. regulations.
- (14) To rescue a person in contact with live wires:
- a) Assume that wire is alive and do not allow it to touch you.
 - b) Do not touch victim with barehands until wire is removed.
 - c) Use a non-conductor such as a dry pole or dry rope to pull the wire from the victim.
 - d) Shut off current at nearest switch.

10.92 RADIO EQUIPMENT

- (1) Do not operate a transmitter in the vicinity of a powerhouses of drilling and blasting operations.
- (2) Antennas should be disconnected in the event of an electrical storm.
- (3) When antennas are strung across clearings, they should be marked with red streamers so that helicopter pilots can see them. Pilots should be advised of the existence and location of these antennas.

10.93 MASTS AND POLES

- (1) To climb a wooden pole of any height beyond the reach of a ladder, standard approved belt and sharp, well cared-for climbers must be used. As a general rule, if the pole is over 25 feet and unless you have had previous experience as a lineman, leave the job for a trained rigger.
- (2) When work of any kind is required on antennas, etc. at the top of a pole fitted with steps, a safety belt cannot be worn while climbing, but must be worn at all times while working. In winter, test each step for icing before placing your full weight on it.
- (3) When it has been determined whether the weight of the mast and strength of the guy wires are sufficient to bear the weight of a climber, all work at any elevation on the mast must be done with the climber strapped securely to a main section of the mast. Climbing a mast fitted with only one set of guy wires should be avoided if possible.
- (4) When doing construction work out of doors and particularly when erecting or dismantling masts, hard hats must be worn at all times.

APPENDIX A

PROPANE GAS IN TRAILERS, PORTA-BUILDINGS, AND LAUNCHES

In view of the possible danger to life which might result from the use of propane gas in trailers, porta-buildings, and launches, the following instructions are issued regarding accident-preventive measures which can be practised by the occupants of such units and by their supervisors.

Although propane is non-poisonous, it can cause death in two other ways:

- (1) By anoxia or suffocation, resulting from all the oxygen in the unit being consumed by propane appliances.
- (2) By leakage of the gas, resulting in a explosion and (or) fire.

It should be emphasized that a permanent vent incapable of being closed or obstructed is to be provided very close to the heater. It is agreed that it is difficult to prevent people from blocking up such a vent during very cold weather or during similar trying conditions, so a warning notice should be displayed alongside the vent. Such plates have already been issued for all propane-gas equipped trailers and porta-buildings. If on reading this memo you find that the unit you are occupying does not have such a notice, requisition one immediately.

Future trailers and porta-buildings will have a special hooded vent provided adjacent to the heater at floor level, but it is felt that on existing units the roof vents will serve the purpose.

In furnace-equipped trailers or porta-buildings, great care should be exercised when banking up with snow or sawdust that cross-ventilation is provided by 4-by-6-inch vents under the unit to enable the furnace to draw fresh air from this space. This will also alleviate condensation.

Fire or explosion can result from leaking pipe joints or faulty appliances. In all Forest Service mobile equipment, gas-piping is of the automotive flared type. Soldered copper water-pipe shall not be used for gas as it is more liable to fracture as a result of jolting during transportation. Even this flared-type tubing should be tested periodically and every time after the unit has been moved. This can be done very easily as most of our recent units have the flag-signal type Fisher regulator. If, after temporarily sealing all pilot lights, the valve is opened and then closed after ten seconds or so, a leak will cause the flag to appear gradually as the pressure just introduced drops in the system. Units not equipped with the flag-type regulator can only be tested with the aid of a sensitive pressure gauge and a length of tubing which can be slipped over one of the pipes supplying oven top burners. It is suggested that the non-flag-type be replaced with Fisher 965B type automatic throw-over valves to simplify testing.

As far as can be determined, no regulations exist which state that propane installations have to be made by a gas-fitter. However, in the interests of safety, any alterations or repairs should be carried out by a gas-fitter if at all possible. If a gas-fitter is not available, a plumber or auto mechanic should be employed, and the occupant or supervisor should satisfy himself visually that the system is then tested as outlined above.