



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

STATE PARKS & HISTORIC SITES

GEORGIA DEPARTMENT OF NATURAL RESOURCES

SAFETY MANUAL

PART I

GENERAL SAFETY SECTION

CHAPTER I

GEORGIA DEPARTMENT OF NATURAL RESOURCES

ADMINISTRATIVE POLICY ON SAFETY

POLICY NUMBER 101

I. PURPOSE

This safety policy is established in accordance with the Board's Policy Statement that specifically directs that such a plan be prepared. This policy is designed to provide guidance for Division Directors and their subordinates regarding the maintenance of safe conditions on Departmentally-managed lands and facilities and to maintain a safe and healthful working environment for employees as well as site visitors.

II. POLICY

DNR Divisions and Offices shall establish and inform their employees about safe operating procedures, and shall provide, within budgetary constraints, the necessary safety equipment and facilities designed to maintain a safe environment in which visitors can be accommodated and employees can work.

III. RESPONSIBILITIES

Division Directors shall implement this policy and shall establish practices, procedures and conditions that will promote safety for Department employees.

Commissioner
Department of Natural Resources

CHAPTER II

SAFETY PROGRAM ACTIVITIES

The preservation of life, prevention of fires and protection of property are of prime importance to the Department. Losses resulting from personal injuries and property damage are costly to the individual employee as well as the Department. Loss avoidance is a primary responsibility of all supervisors; each supervisor is held accountable for controlling losses in their operation. Improvements in safety and fire prevention facilities and programs contribute to the overall well being of the Department.

This can be accomplished by each supervisor planning and making frequent:

- A. Job studies to identify existing and probable accident causes.
 - B. Inspections of facilities, equipment and vehicles, and reporting safety problems observed on such inspections.
 - C. Observation of work methods and housekeeping conditions.
1. Accident Record System

Records of accidents are essential to an efficient and successful safety plan. Records supply the information necessary to transform costly ineffective strategy for safety into a planned safety program that identifies and controls the specific conditions and acts that cause losses.

To be effective, preventive measures must be based on reasonably complete and unbiased knowledge of the causes of an accident. The primary purpose of an accident report is to furnish that information. The supervisor should make a detailed report on each accident even when no injuries occur most frequently, and will suggest counter measures necessary to reduce accidents in those areas.

Accidents should be classified and recorded, and a report prepared and submitted to management showing rates, circumstances, and causes of accidents. Accident reporting forms and directions for completing forms are available from the personnel office. If an employee is injured on the job, it must report the injury to the supervisor or up-line supervisor immediately. If the injury does **not** require medical treatment, an *Incident Form* (attachment 1) must be completed by the supervisor and given to the personnel manager. If medical treatment is required, the **supervisor** should complete a *First Report of Injury* (attachment 2), then report the injury to DOAS by calling 877-656-RISK (7475). Then call AmeriSys at 678-781-2848 or

800-900-1582 to talk to a case manager who will assist in selecting a physician, scheduling an appointment, and obtaining follow-up care. Reporting property damage or loss of property, Administrative Procedure Number 15, explains responsibilities related to property damages.

2. Disaster Planning and Response

Locations subject to severe weather such as tornadoes, hurricanes, bomb threats, and other emergency situations where there is danger to employees, property, and the community shall have written plans depicting responsibilities for preventive measures, corrective action, and other applicable activities.

3. Evaluation of Program

Supervisors shall establish meaningful goals for the safety and health program and periodically evaluate the progress being made to achieve them. If progress is not satisfactory, then steps must be taken to revise methods that are being used in order to have a successful safety and health program.

4. Responsibilities

A. Supervisors:

Supervisors are the keys to safety programs because of their constant contact with employees. Supervisors must actively support the policy to achieve satisfactory protection against mishaps.

The supervisors must control the actions of their employees, the use of materials and the work environment. They, within the limits of their authority, are responsible for:

1. Insuring that employees understand the properties and hazards of the material stored, handled, or used by them.
2. Seeing that the necessary precautions are observed when using equipment, including the use of proper safeguards and proper personal protective equipment.
3. Insuring that employees understand and properly follow the work procedures established for their safety.
4. Insure that safety meetings are planned and conducted for employees (at least quarterly).

B. Employees:

Employees have the following responsibilities:

1. Adhere to all safety instructions, rules and regulations.
2. Use protective equipment and devices as required.
3. Report all unsafe conditions and practices to their supervisor.
4. Report accidents to their supervisor immediately.
5. To take precautions to protect the health and safety of themselves, co-workers and visitors.
6. Be familiar with the operation and safety instruction of their job assignments.
7. Cooperate with all other employees in learning and applying safety work practices.
8. Be knowledgeable of emergency procedures of their area.
9. Attend scheduled safety meetings.

CHAPTER III

TRANSMITTAL OF THE GEORGIA DEPARTMENT OF NATURAL RESOURCES SAFETY MANUAL

This safety manual is the result of the combined efforts of the following: Parks, Recreation and Historic Sites; Wildlife Resources; Historic Preservation; Pollution Prevention Assistance; Environmental Protection; and Coastal Resources Divisions of the Georgia Department of Natural Resources (hereinafter called "the Department").

The Department is vitally interested in maintaining a safe environment in which employees can perform their duties and in the safety and well being of visitors who come to enjoy the facilities the State of Georgia has to offer. This safety manual cannot possibly cover all safety problems that might arise. It does, however, call to your attention dangers and unsafe practices that cause a large percentage of accidents occurring within the Department. By calling attention to known problem areas, the Department seeks to drastically reduce accidents. Employees should be constantly on the alert for hazards and safety problems not covered by this safety manual also, and should any arise, they should be reported to their immediate supervisor immediately and action taken to correct them initiated as soon as possible.

Each employee of the Department is required to certify in writing that he/she has read and understands the contents of this safety manual. A copy of this certification shall be kept on file at each work unit for future reference. Attached is a sample copy of the form to be used.

CERTIFICATION COPY

TO: _____
(Employee Supervisor)

FROM: _____
(Employee)

(Employee Work Location/Division)

SUBJECT: _____ Safety Manual _____

I have read and understand the contents of the Department of Natural Resources Safety Manual. I will abide by the rules and regulations as set forth in this manual to the best of my ability.

Signature

Date

CHAPTER IV

ACCIDENT INVESTIGATION

Accidents should be reported at once and investigated immediately. Near miss accidents and accidents resulting only in property damage should also be investigated. All major accidents involving either death or serious injury to persons or property must be reported immediately to the appropriate Division Director.

When a person is injured, the supervisor must take emergency actions to have first aid administered, to obtain professional medical attention at once, and to protect fellow employees, visitors and equipment. The investigation must then begin immediately into the circumstances of the accident.

The supervisor should use the appropriate form to report the injuries. This form should elicit reasonably significant information about an injury in order to help the supervisor get to the real cause of the situation – those factors which, if eliminated, will prevent recurrence.

These procedures have been found particularly effective when investigating accidents:

1. Go to the scene of the accident promptly.
2. Talk with the injured person, if possible. Talk with witnesses. Stress getting the facts, not placing the responsibility or blame.
3. Listen for clues in the conversation about you. Unsolicited comments often have merit.
4. Encourage people to give their ideas for preventing the accident.
5. Study possible cause – both unsafe conditions and unsafe practices.
6. Confer with interested persons about possible solutions. The problem may have been solved by someone else.
7. Write a report, using a printed form that allows a narrative description.
8. Follow up to make sure conditions are corrected. If they cannot be corrected immediately, report this to all concerned.
9. Communicate to appropriate DNR personnel any corrective action taken so that all may benefit from the experience.

When following this procedure, keep these two basic points in mind:

- Most accidents involve both unsafe conditions and safe acts, and;
- The purpose of accident investigation is prevention of future accidents and not fixing the blame.

CHAPTER V

MOTOR VEHICLE ACCIDENT REPORT PROCEDURES

- I. In the event an accident occurs while operating a State of Georgia vehicle, the following procedures should be taken:
 - (a) Assist the injured
 - (b) Report accident to Georgia Highway Patrol or Sheriff's Office as soon as possible
 - (c) Report accident to Claims and Loss Department (refer to information packet in vehicle for phone numbers)
 - (d) Report accident to supervisor as soon as possible
 - (e) Ask witnesses to sign witness card contained in vehicle information packet
 - (f) Complete "Emergency Request" card and give to passing motorist when necessary
 - (g) Do not admit responsibility for accident.
- II. Complete DOAS Auto Notice Of Loss Form (NOL-REV-DOC 5/14/08, Sample included) and fax to Risk Management Services to 770-344-5074 within 48 hours of discovery of the loss.
- III. Supervisors are to complete the Supervisors Accident Follow-up Checklist (RMS101 Form-3, Sample included) to the Risk Management Services Division (RMS) within 2 work days of being advised of an on-the-job accident that occurred while driving on state business.
- IV. If property of others is damaged (or alleged) as a result of the State's operations, whether negligent or not, report the claim directly to DOAS / Risk Management Services by faxing the Liability Incident Report Form (DOAS/RMS_GL Report Form, Sample included) to: Ed Finnegan, State Auto Insurance Program Officer, Department of Administrative Services, fax number 770-344-5074. Time is of the essence. Do not delay reporting the claim because you do not have all the information regarding the accident. Any additional information can be provided at a later date. Use multiple sheets for more than one Claimant.

**State of Georgia
Department of Administrative Services
Risk Management Services**

AUTO NOTICE OF LOSS FORM

Important: Insurable Auto losses must be reported on this form within 48 hours of discovery of the loss by the insured agency. Please fax completed copy to 770-344-5074 or email to ed.finnegan@doas.ga.gov.

Please provide the following information:

Date of loss: _____ Time of loss: _____ am/pm Loss Location:

Your Agency: _____ Department:

Agency Ref.#: _____ Agency
Contact: _____

Contact Phone Number:

About Insured Vehicle: Year: _____ Make: _____ Model:

Vehicle Identification number (VIN): _____ DOAS ID#:

Cause of Loss (Insured Peril):

Type of Damages:

Loss Description (Required):

(If more space is needed please attach a second page.)

Loss control measures taken to reduce/prevent future losses:

Estimated Loss Amount: _____

Is this vehicle enrolled in the ARI program? Yes _____ or No _____

Agency Insurance Coordinator

Date

Phone Number

Fax Number

E/14/08



MOTOR VEHICLE USE PROGRAM SUPERVISOR'S ACCIDENT FOLLOW-UP CHECKLIST

Supervisors are to complete this checklist and forward it to the Risk Management Services Division (RMS) within 2 work days of being advised of an on-the-job accident that occurred while driving on state business.

DRIVER INFORMATION	
Name	Work Unit
Date of Accident	Frequency of driving on state business <input type="checkbox"/> Weekly or more often <input type="checkbox"/> Infrequently

CHECKLIST		
<input type="checkbox"/> Meet with the Driver to discuss the details of the accident.		
<input type="checkbox"/> Did the driver meet the following requirements? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Requirement	Date	
Obtain all necessary information at the scene		
Call loss into 1-877-656-7475 or ARI within 48 hours		
Respond to any acknowledgements or requests sent by DOAS RMS		
Obtain the police report, if requested, and forward to DOAS RMS		
<input type="checkbox"/> Discuss appropriate corrective action, depending on whether the driver was cited for the accident.		
Recommendation	Date	
On-line defensive driving course at employee's expense		
View an appropriate driver safety video		
No further action warranted		
<input type="checkbox"/> Forward to DOAS Accident Review Panel for the following determinations:		
<input type="checkbox"/> Preventable		
<input type="checkbox"/> Non-Preventable		
<input type="checkbox"/> Additional Recommendations		
<input type="checkbox"/> Forward copy to Human Resources for placement in the employee's personnel file.		

SUPERVISOR INFORMATION	
Printed Name	Work Unit
Signature	Date

STATE OF GEORGIA
Liability Incident Report Form

If property of others is damaged (or alleged) as a result of the State's operations, whether negligent or not, report the claim directly to DOAS / Risk Management Services by faxing this completed form to: Ed Finnegan, State Auto Insurance Program Officer, Department of Administrative Services, fax number 770-344-5074.

Time is of the essence. Do not delay reporting the claim because you do not have all the information regarding the accident. Any additional information can be provided at a later date. Use multiple sheets for more than one Claimant.

Accident Information - General Liability

State Agency involved:

Date of the incident:	Incident time:
Incident location:	City and County:
Description of the incident:	
Police authorities contacted:	If yes, Accident Report Number:

Claimant Information

Name & address of the Claimant:	Home Telephone No. Work Telephone No.
Injured party date of birth:	Social Security No.

Injury Information

Brief description of the claimant's injury:	
Fatality:	<input type="checkbox"/> Yes <input type="checkbox"/> No
What initial treatment was given?	By whom?
Was hospital treatment needed?	Which hospital?

Witness Information

Were there any witnesses?	If so, their name, address & phone no:
---------------------------	--

Property Damage to Others Information

Claimant's property involved:	Where is the property located now?
Damage to Claimant's property:	Repair estimate:
Comments:	

Your Name: _____

CHAPTER VI

EMPLOYEE INJURY INFORMATION

Workers Compensation

EMPLOYEE INJURY INFORMATION

To maintain a consistent and updated policy on how to handle employee injury occurrences, all instructions, procedures, forms and references are now located at the Georgia Department of Natural Resources intranet site.

Directions to employee injury forms and instructions:

1. Access the website <http://dnrnet.dnr.state.ga.us>
2. Log on or create new user
3. Choose “Human Resources”
4. Choose “Workers Compensation”

Directions to workers compensation procedures:

1. Access the website <http://dnrnet.dnr.state.ga.us>
2. Log on or create new user
3. Choose “Human Resources”
4. Choose “Standard Operating Procedures”
5. View “Workers Compensation” section including procedure HR021 – Workers Compensation.

CHAPTER VII

SAFETY REPRESENTATIVES

AND/OR COMMITTEES

Safety committees play an important role in a successful safety program. Committees in themselves should not be considered as a “safety program” but they do have two basic functions:

- A. Creating and maintaining an active interest in safety, and;
- B. Serving as a means of safety communication.

Each site/work unit will have a designated safety representative responsible for keeping supervisors (managers) informed on safety matters.

Each supervisor will work closely with management to correct safety concerns and, as necessary, bring the matters to attention of Division Director.

Each site/work unit will have a small safety committee (2-3 maximum) who will meet on a regular basis to discuss safety concerns and forward recommendations/reports up through the chain of command.

Division directors are accountable for implementing safety plans and procedures.

The safety committee shall undertake the following basic functions:

- A. Discuss safety policies and make recommendations for adoption.
- B. Identify unsafe conditions and practices; recommend remedies.
- C. Implement management-approved directives into practice.
- D. Recommend training for DNR personnel.
- E. Keep supervisors informed on safety matters.
- F. Maintain the interest of workers related to their cooperation in the prevention of accidents.
- G. Make safety activities an integral part of operating policies, methods and functions of operation.

- H. Provide opportunities for free discussion of accident problems and preventive measures.
- I. Help site supervisors evaluate safety suggestions.

A copy of safety committee meeting minutes shall be sent to the Division Director.

ROLE OF DNR SAFETY DIRECTOR

The Safety Director is not assigned direct responsibilities for implementing the Safety Plan. He is to be considered a source of technical assistance to Division Directors and will provide the following:

1. Coordinate the annual review and update of the DNR Safety Plan with Division Directors.
2. Identify safety training resources (films, flyers, training courses) for use by Division Directors.
3. Be available for technical assistance to Division Directors to advise of problem resolution for specific safety matters.

SAFETY MEETINGS

In order to incorporate safety into the everyday operations of the Department, periodic training should be scheduled for all employees of the various work units. Safety training can consist of specialized instruction on a particular piece of equipment to an informal discussion among employees at the work unit talking about the proper storage of work tools. A safety meeting does not necessarily have to consist of a planned agenda and an expert in the field to address the group.

The supervisor of the unit should be aware of the safety topics that would be appropriate for his employees and schedule the proper time and method to provide the information.

Safety meetings and training should be made a part of staff meetings, region/district meetings, and conferences to keep safety a regular part of employee activities. Periodic meetings are required and a safety topic should be scheduled for discussion at least once a quarter.

Safety meetings should be documented in order to have a record of topics discussed, employees attending, instructors, etc. The safety meeting report form that follows should be used for each meeting and kept on file at the work unit.

The unit supervisor has the responsibility to ensure that safety meetings are scheduled, consist of topics that are relevant and usable by employees, and are properly documented. When each of these criteria is met, safety training will be enjoyable, educational and a normal part of each employee's work duties.

SAFETY MEETING REPORT FORM

NOTE TO SUPERVISOR: Complete and file this form each time a safety meeting is conducted.

TOPIC: _____ DATE: _____

INSTRUCTOR: _____ TIME: _____

PERSONS ATTENDING:

1. _____ 16. _____
2. _____ 17. _____
3. _____ 18. _____
4. _____ 19. _____
5. _____ 20. _____
6. _____ 21. _____
7. _____ 22. _____
8. _____ 23. _____
9. _____ 24. _____
10. _____ 25. _____
11. _____ 26. _____
12. _____ 27. _____
13. _____ 28. _____
14. _____ 29. _____
15. _____ 30. _____

Comments and Suggestions: _____

Signed: _____
Unit Supervisor

SITE REPRESENTATIVE

Each location shall have a safety representative. It is desirable that this person report all safety matters directly to the location superintendent or supervisor.

Some of the safety representative's responsibilities are as follows:

- A. Formulating, administering, and making necessary changes in the safety program.
- B. Submitting to management periodic reports (as required) on the status of safety.
- C. Acting in an advisory capacity on all matters pertaining to safety.
- D. Maintaining the accident record system, making necessary reports, personal investigations of accidents, and checking action taken to eliminate accident causes.
- E. Involvement in the safety training of employees and supervisors.
- F. Making inspections for the purpose of discovering and correcting unsafe conditions and practices before they cause accidents.
- G. Initiating activities that will stimulate and maintain employee interest in the safety program.
- H. Supervising fire prevention and fire fighting activities where they are not the responsibilities of other departments.
- I. Setting standards for safety equipment to be used by personnel.
- J. Recommending provisions for safety in specifications of new structures and repairs of existing ones.

GEORGIA DEPARTMENT OF NATURAL RESOURCES

SAFETY MANUAL

PART II

SUMMARIES OF COMMONLY USED SAFETY PROCEDURES WITHIN DNR

General Introduction

The objective of this chapter is to increase employee awareness of potentially hazardous situations and to encourage the use of common sense and good judgment in performing duties and assignments. Safety is both a personal and management responsibility. If one believes an assigned duty involves unsafe situations then they should immediately advise their supervisor. If the situation is not resolved, a written statement should be sent through normal management channels, with a copy sent to the Division Director.

Any employee injured on the job should immediately report the incident to their supervisor. This procedure must be followed to insure expeditious handling of warranted workers compensation benefits.

At the scene of an accident, first aid may need to be administered. Limit such aid to that which is absolutely essential for the circumstances and reserve further treatment for professional medical personnel.

Any employee could be faced with potentially hazardous on-the-job situations. Personal protective devices are available for such conditions and should be used when appropriate. A supervisor also has the authority and responsibility of requiring that certain protective devices be worn or certain precautions taken, if deemed necessary.

Chapter I

Aircraft Safety

A. Introduction and Objectives

Department of Natural Resources staff use aircraft frequently for such purposes as passenger transport, observations, inspections, photographing, and shipping samples. When using a chartered or commercial aircraft, DNR personnel should understand all aspects of the planning, operation, and use of the aircraft, both fixed wing and helicopter types. As working passengers or simply passengers, staff must understand that they have responsibilities to accomplish their mission.

B. Passenger Responsibilities

All passengers must understand that the aircraft pilot is in charge of the aircraft and his requests must be obeyed.

Working passengers must provide the pilot with the information he needs to file the flight plan required by the Federal Aviation Administration (FAA), including:

- the number of passengers and their weight
- the kind of equipment and supplies to be carried and its weight
- the objective of the mission
- the destination, or territory to be over flown, and
- the time needed at, or over, the sampling or observation site.

C. Pilot Responsibilities

The pilot is responsible for the safety and well being of the passengers and for the safe operation of the aircraft. The pilot will see that the cargo is properly secured and is loaded to comply with weight and balance requirements of the aircraft. If any hazardous materials are included in your supplies and equipment, the pilot must be made aware of them.

The pilot will monitor the weather conditions at the target and en route to the target. If conditions are unfavorable, the pilot may (and should) decide to postpone the trip. You should not argue the pilot's decision.

D. Preparing and Loading

Packing and stowing the hazardous materials must conform to U.S.D.O.T. regulations for packaging and shipping to protect the aircraft and personnel. Chemicals and samples must be placed in clean, sealed containers and packed to prevent (or contain) leakage, should an unavoidable release occur. Sampling equipment should be decontaminated and/or enclosed before loading into the aircraft.

Cargo should be placed wherever the pilot designates that it go. Do not drop heavy objects on the floor of the cargo area or the lip of the door; costly repairs and delays could result. Objects should not be placed or dropped on the plastic, chin section of a helicopter.

E. Approaching an Aircraft

Approaching an aircraft requires the application of considerable common sense with particular attention given to several rules:

- Always keep out of the way when a plane is taxiing, and wait for the engine(s) to stop before you approach.
- Approach any aircraft so that the pilot can see you, or as directed by the pilot.
- Stay clear of a plane's propellers or jet intake or helicopter's rotors, whether or not they are turning.
- Stay 100 feet from helicopters at all times unless you absolutely must go nearer.
- If you must approach a helicopter, stay clear of the tail boom and avoid walking under or near the tail rotor blades.
- If you must approach a helicopter while the rotors are turning, do so in full view of the pilot and under his direction. Approach from the safe level as the helicopter; an approach from a higher level might bring you too close to the blades.
- If you approach when the main rotor is turning, run in a crouched position; the main rotor blades can be blown below their normal operational level.
- Never approach a helicopter with an object longer than four feet while the rotors are turning.

F. Emergency Procedures

Emergencies in an aircraft can take many forms. If an emergency cannot be coped with in the air, the aircraft will make an emergency landing, usually successfully.

During a forced landing, follow the pilot's instructions. The pilot will tell you when, where, and how to exit from the aircraft. The pilot may ask you to jettison doors, inflate flotation equipment, don protective gear, and/or assist the injured. You may also be asked to help activate emergency signaling equipment.

Chapter II

BIOLOGICAL HAZARDS

Field activities may pose a significant threat from biological hazards (snakes, spiders, rodents, etc.). There is also the danger of developing infections after getting punctures, cuts, or scratches while climbing over thorny plants in outlying areas.

Potential biological hazards include: animal bites or insect stings, contact with certain plants, and exposure to microbial agents.

It is important to know the preferred habitat and biogeography of stinging insects, poisonous spiders, snakes, plants, and animals that may carry rabies, to avoid contact.

The objective of this section is to review common animal, plant, and microbial hazards that may be encountered during inspections and to discuss appropriate safety precautions. The following Tables present specific information on hazardous plants and animals that may be found in Georgia.

A) *Animals and Pests*

1. A number of animals and pests may be encountered in fieldwork. General safety rules can help protect you from these hazards. Follow these general guidelines to prevent close encounters of the painful kind:
 - a) Carefully look for pests before placing your hands, feet, or body in areas where pests live or hide (e.g., woodpiles or crevices).
 - b) Avoid contact with sick or dead animals.
 - c) Wear clothes made of tightly woven materials and tuck pants into boots.
 - d) Wear boots or snake leggings.
 - e) Wear insect repellent.
 - f) Keep a first aid manual and kit in your vehicle on any excursion so you can treat bites or stings. If the pest is poisonous or if the bite does not appear to heal properly, seek medical attention immediately.
 - g) Be aware of the appearance and habitat of likely pests, such as those described in the following pages.
 - h) Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses.
 - i) It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
 - j) Avoid wasp or hornet nests.

B) *Biting Insects and Arachnids (Mosquitoes, flies, fleas, ticks, chiggers and spiders)*

1. **Mosquitoes** – There are over 50 species of mosquitoes in Georgia, only a few of which feed on man. The female mosquito must have a blood meal before her eggs will develop. Eggs are laid near or on the water, depending on the species. The eggs hatch into larvae or "wigglers." These develop into pupae or "tumblers" and the adult emerges from the pupa. Egg to adult can occur in seven to 10 days. Female mosquitoes will range from 300 feet to 20 miles or more in search of a blood meal, depending upon the species. Most can fly in a radius of at least one mile. Most, but not all, females prefer to feed in the evening. The saliva they inject helps to keep the blood from coagulating as they feed; it is also an irritant responsible for some of the itching and swelling. Mosquitoes that bite in the evening can breed in ditches, ponds, temporary pools, marshes and swamps. Mosquitoes that bite during the day often breed in artificial containers, such as tires, buckets, bottles, etc. Mosquitoes are known to transmit such diseases as encephalitis and West Nile Virus.
2. **Deer Flies and Horse Flies** – These are strong fliers and serious pests of warm-blooded animals and people. Only the females need a blood meal. Their mouthparts are bladelike and it is painful when they cut through the skin. When the blood is flowing from the wound they will "lap" it up. The larvae feed in a wide variety of wet or damp sites that are high in organic material. Most females feed during the warmer parts of the day, but some species prefer the hours at dawn or dusk. Horse flies are larger than the deer flies and usually have clear wings while the deer fly has dark markings on the wings.
3. **Chiggers** – The chigger is a tiny red-colored mite, which in its immature stage will feed on man, rodents, birds, snakes and a wide variety of other animals. It is especially common in second growth areas, blackberry patches and forest edges. Chiggers are very active in crawling about looking for a host, and may crawl over the skin for some hours before beginning to feed. When the mouthparts are inserted into the skin, a fluid is injected that dissolves the cells upon which it feeds. The chigger does not, as commonly believed burrow into the skin. Itching can begin three to six hours after exposure. Examination of the skin may reveal minute red mites moving rapidly over the surface. A soapy bath taken as soon as their presence is noted will often remove many of them before they begin feeding.
4. **Ticks** – Ticks are found nearly everywhere in North America, and can transmit diseases such as Rocky Mountain spotted fever, Lyme disease, human ehrlichiosis, and human granulocytic ehrlichiosis (HGE). To reduce your chances of being exposed to ticks, wear long pants and tuck the pants legs into your socks; use a repellent containing the compound DEET (N-diethyl-meta-toluamide) on exposed skin, except for the face; check your body regularly for ticks, including inspection of

the neck and scalp. Remove attached ticks immediately (table 9-1). The two most common ticks that will feed on man in Georgia are the American dog tick and the lone star tick. Both ticks feed on a wide variety of animals, although the American dog tick is especially common on dogs, and the lone star tick on deer and livestock. Ticks are most common along trails, feeding and resting areas of their hosts. Both can carry Rocky Mountain Spotted Fever (RMSF), a dangerous disease. It causes a skin rash and high fever that may be mistaken for measles.

The black-legged tick is less commonly found on people, but it carries Lyme disease. This disease initially has flu like symptoms and sometimes an expanding red rash at the bite site. Months or years later the disease can invade the neurological, cardiovascular or joints of the body. Lyme disease mimics other disease, such as rheumatoid arthritis. The characteristic rash only occurs in about 70 percent of the cases. Early treatment with antibiotics is much more effective than months or years later.

Since imbedded ticks need about 12 to 24 hours to transmit RMSF or Lyme disease, early removal is a good preventative for these diseases. Any imbedded ticks should be removed with tweezers close to the point of attachment. Keep tick wrapped in cloth or paper to avoid contact with the fingers. Juices from an infected tick can transmit RMSF. Remove the tick by pulling gently but firmly.

5. **Scorpions and spiders** – Arachnids such as scorpions and spiders are cause for caution by the field team. Spiders and scorpions are known to inhabit enclosed, dark spaces; for example, inside shoes or the corners of well houses and shelters.

- a) **Scorpions.** Scorpions are known to frequent the desert, but also have been found frozen in ice. Scorpions are not easily seen in the wild. They are nocturnal creatures that are sensitive to vibrations, either in the air or on the ground. When humans are stomping around, scorpions usually run for cover. Scorpion stings often involve an encounter between a big toe and a scorpion that has crawled into a shoe. Check shoes and boots left in the field vehicle before putting them on. **Beware of putting your hands and feet into small, dark spaces.**
- b) **Spiders.** Although few spiders in North America bite people, and the venom of most is harmless (Audubon Society, 1980), exceptions include the black widow and the brown recluse (fig. 93). The black widow (*Latrodectus mactans*) has a fairly large geographical range. Red and brown widow spiders are found mainly in the Gulf Coast region of the United States. The brown recluse (*Loxosceles reclusa*) frequents areas of human habitation and prefers dark spaces such as equipment shelters, as well as areas in the wild. It is advisable to be familiar with the area in

which you are working and take care when walking and when reaching into small spaces.



Southern black widow spider
(underside view)



Brown widow spider



Red widow spider



Brown recluse spider

6. **Bees and wasps** – Venomous insects of common concern include bees and wasps. Bee stingers are equipped with barbs that should be scraped off if a person is stung---using forceps or tweezers to pull the stinger out can force more venom into the wound (table 9-1). A wasp stinger has no barb; the venom is injected and the stinger usually slides out. The yellow jacket (a vespid wasp) nests in the ground and will aggressively defend the nest if disturbed, particularly in the late summer and early fall. Stings in the mouth or throat sometimes result when a bee or wasp has flown into a can of soda. Seek medical attention if symptoms warrant.
7. **Sand Gnats** – Sand gnats as we call them, are members of the family *Ceratopogonidae* or "biting midge" family. The sand gnat that seems to be at its worst when the fishing is at its best! It hatches out in mass numbers when the temperature and season are just right for outdoor activity. Sand gnats don't just puncture your skin like mosquitoes do. Instead they rip it open using sharp cutting teeth located on the mandible. After inserting two sharp, sword-like blades into the skin as

anchors, the sand gnat uses the cutting teeth to rip up the skin and get the blood flowing. As if that weren't enough, the gnat then squirts a chemical into the open wound to inhibit blood clotting. The tiny pool of blood that forms is then sucked up through a straw-like structure called the proboscis. Some human victims have allergic reactions to the chemical and must endure itchy red spots or even swollen welts.

8. **Fire Ants** – At least three fire ant species are found in Georgia. Two are native to the state: the tropical fire ant, *Solenopsis geminata* Fabricius and the southern fire ant, *Solenopsis exloni* McCook. These ants are rarely seen any more; because they have largely been displaced by the more aggressive red imported fire ant, *Solenopsis invicta* Buren. Fire ants look very much like ordinary house or garden ants. They're about one-eighth to one-fourth inch long and are reddish-brown to black. Fire ant colonies are dome-shaped mounds that may be one to two feet high. Mounds are often found in open areas such as lawns, pastures, along roadsides and unused cropland. Fire ants rarely build nests in heavily shaded or frequently cultivated areas. Nests will contain ants of different sizes. Unlike most other ants, they will aggressively attack, in mass, anything that disturbs their mound.

Fire ants are so named because their venom induces a painful, fiery sensation. When disturbed, fire ants are very aggressive. The ant grips the skin with its mandibles or jaws and stings its victim several times in a circular pattern around the point of mandible attachment. Because of the ant's aggressive nature and capacity for multiple stings, an attack usually results in several stings. Some people who are stung experience only local reaction and temporary discomfort but, in most, a swollen red area will occur followed by a sterile pustule within 24 hours. Although the venom is bactericidal, secondary infections due to scratching may occur. Reaction to fire ant stings is similar to reaction to the stings of bees, wasps, hornets and yellow jackets.

The overwhelming majority of fire ant stings are medically uncomplicated, but evidence shows that people hypersensitive to fire ants are more likely to be hypersensitive to other venomous insects. As small percentage of people stung – probably less than .5 percent – experience a systemic anaphylactic reaction. These reactions occur within minutes of a sting and vary in severity. Some individuals may require hospitalization, and the reaction may be life threatening. Anyone stung and displaying marked symptoms of hives, weakness, dizziness, wheezing, shortness of breath or confusion should be given immediate medical attention.

C) SNAKES

Snakes deserve our respect, but they do not have to be feared. Only about 10 percent of the approximately 3,000 species of snakes in the world are poisonous. Differences between poisonous and nonpoisonous

snakes of North America are illustrated in figure 9-4. In the event of snakebite, take the victim to the nearest medical facility as soon as possible. Call the medical facility first if time allows. Medical personnel should treat even a person who has been bitten by a nonpoisonous snake, because some people are allergic to the foreign protein in snake saliva. Refer to table 9-1 for procedures to follow if bitten. The best advice regarding snakebites is to prevent them in the first place. ***Snake expert Maynard Cox (1994) recommends:***

- Do not put your hands or feet where you cannot see.
- Never handle a snake unnecessarily, dead or alive, poisonous or nonpoisonous.
- If you come upon a poisonous snake, turn and run. A snake normally can strike up to one-half or two-thirds of its body length, but if provoked it can strike up to its full body length.

A common symptom of a poisonous snakebite from pit vipers (copperheads, cottonmouths or water moccasins, and rattlesnakes) is a burning, fiery, stinging pain at the bite site. Other symptoms could include swelling; skin discoloration; nausea and vomiting; a minty, metallic, rubbery taste in the mouth; sweating and chills. If the pain does not get any worse and remains localized, venom probably was not passed. If the pain becomes severe, venom was probably injected.

1. **Copperheads** (*Agkistrodon contortrix*) have a wide distribution throughout the central, mid-Atlantic, and southern United States. They can be found on wooded hillsides or in areas near water. Although the bite of a copperhead can be painful, it is unlikely to result in an adult human death.



(Copperhead - Field photo taken at Genesis Point in Bryan County)

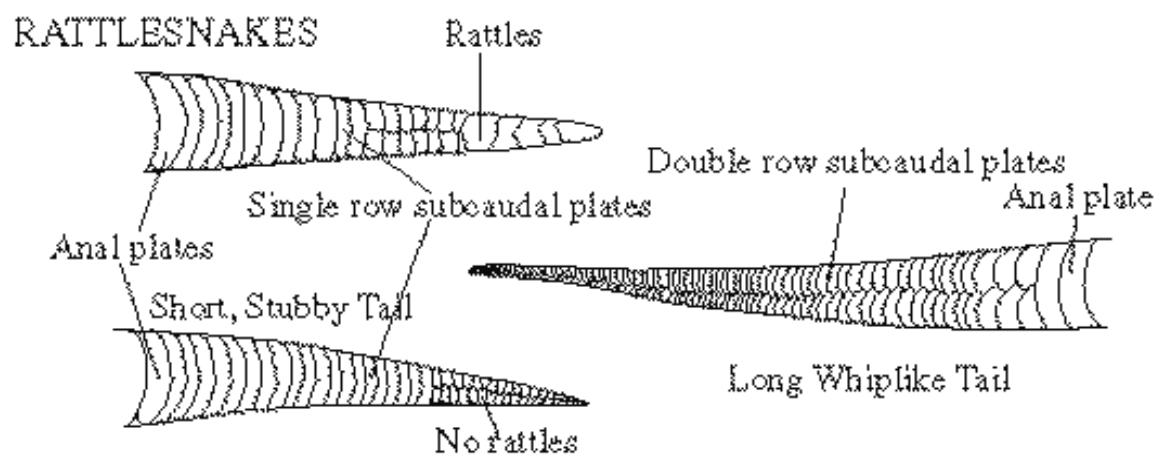
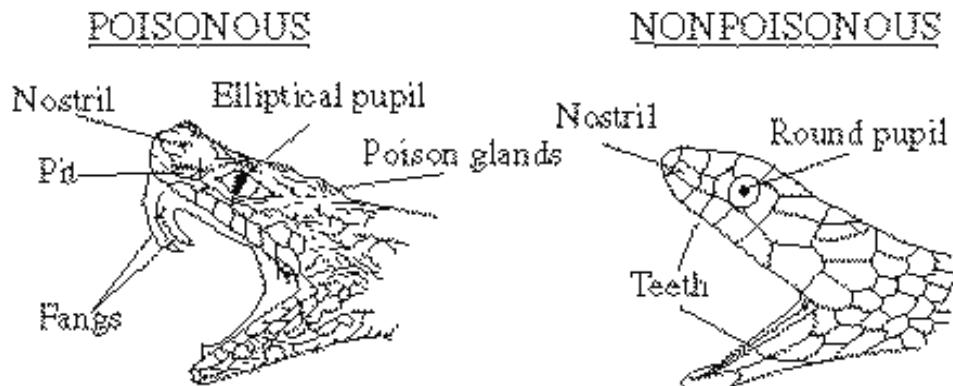
2. **Cottonmouths or water moccasons** (*Agkistrodon piscivorus*) are found in the southeastern United States and are never far from water. Cottonmouths usually swim with their entire body on top of the water (Huegel and Cook, undated). Cottonmouths might be seen in the daytime, but they are more active at night. They are an extremely aggressive snake and should not be approached.
3. **Rattlesnakes** have been found in every state except Alaska, Delaware, Hawaii, and Maine. All other states have at least one species of rattlesnake, and many have three or four. Arizona, for example, has 17 species or subspecies of rattlesnakes (Kauffeld, 1970). A rattling sound usually alerts that a nearby rattlesnake has been disturbed and can be preparing to strike, but if the snake is sufficiently disturbed, it might not rattle at all.



(*Eastern Diamond Back Rattlesnake*)

4. **Eastern coral snake** (*Micrurus fulvius*) is found in the southeastern United States. It is identified by wide red and black bands separated by a narrow, bright yellow band. The red and black bands never touch. Symptoms are different for bites from coral snakes. The coral snake's venom is extremely toxic, but little or no pain may occur from the bite. Look for teeth marks at the puncture wound. Other symptoms could include euphoria, excess salivation, convulsions, weakness, and paralysis (Cox, 1994).

DISTINGUISHING FEATURES OF POISONOUS AND NONPOISONOUS SNAKES OF NORTH AMERICA



COPPERHEADS & COTTONMOUTHS



Table 9-1. Guidelines on potentially dangerous animals

[mm, millimeter; in., inch; cm, centimeter; ft, foot; lb, pound; mph, mile per hour]

Animals	Description/ Characteristics	Procedure
		Arachnids and Other Insects
Black widow spiders (Black, brown and red widow spiders are illustrated in figure 9-3.)	Female (only one that bites) is black with abdomen almost spherical, usually with red hourglass mark below or with 2 transverse red marks separated by black. Spiderling is orange, brown, and white, gaining more black at each molt. Habitat among fallen branches and under objects, such as well shelters, furniture, and trash.	If bitten, seek medical attention as soon as possible.
Brown recluse spiders	Orange-yellow thorax with dark violin pattern. Bases of legs orange-yellow, rest of legs grayish to dark brown. Abdomen grayish to dark brown with no obvious pattern. Habitat outdoors in sheltered corners, among loose debris; indoors on the floor and behind furniture in houses and outbuildings.	
Scorpions	Nocturnal, sensitive to vibrations. Field boots are a favorite hiding place.	
Ticks	Small, less than 3 mm (<1/8 in). Clamps to host using a dart-like anchor located just below the mouth.	<p>Do</p> <ul style="list-style-type: none"> Check for ticks during and after field work Remove with tweezers within 24 hours. <p>Don't</p> <ul style="list-style-type: none"> Leave the head imbedded. Extract using matches or applying petroleum jelly or other coating.
Bees	Bees vary in size from 2 mm (0.08 in) long to 4 cm (1.6 in) long; divided into a number of family classifications which are determined by mouthparts and other characteristics that are difficult to see without dissection.	<p>Do</p> <ul style="list-style-type: none"> Avoid all bee hives and wasp nests. Scrape off the bee stinger with a knife or other flat object. Use an over-the-counter sting ointment or a solution of baking soda, meat tenderizer, and ammonia. <p>Don't</p> <ul style="list-style-type: none"> Use forceps or tweezers to pull the bee stinger out.
Wasps	Wasps vary in size from minute up to 5 cm (2 in) long; adults distinguished by a narrow waist between the first and second abdominal segments.	
Snakes and Alligators		
Copperhead snake	Elliptical eyes; short, stubby tail.	Do not confront a snake—turn and run
Cottonmouths or water moccasin snakes	Elliptical eyes; short, stubby tail.	If bitten:
Rattlesnakes	Usually swim with their entire body on top of the water. Never far from water. Most active at night. An extremely aggressive snake. Elliptical eyes; short, stubby tail. The rattle is a sign of fear, but if the snake is sufficiently disturbed, it might not rattle at all.	<p>Do</p> <ul style="list-style-type: none"> Reassure victim Treat for shock. Keep victim lying down; elevate feet 10 to 12 in. Seek medical attention as soon as possible. Call medical facility while en route, if possible. <p>Don't</p> <ul style="list-style-type: none"> Cut and suck affected area. Apply ice or a tourniquet. Leave victim unattended.
Eastern coral snakes and Arizona coral snakes	Wide red and black bands separated by a narrow, bright yellow band; the red and black bands never touch; round pupils; short, stubby tail.	

D) ALLIGATORS

The American alligator (*Alligator mississippiensis*) is found in swamps, rivers, and lakes, primarily of the southeastern United States. Alligators are fairly inactive in the winter months; when the water temperatures are cool; their metabolism slows down and there is little need for food. The breeding season is mostly during April and May; therefore males and females move around more during this time. Treat alligators with extreme caution. Some can become a nuisance when they lose their fear of humans and usually have to be destroyed by licensed trappers. **Never approach an alligator, either on land or in the water.** Alligators can outrun humans for short distances.

(American Alligator - Field photo taken on Hutchenson Island.)



F) POISONOUS PLANTS



1. **Poison ivy** (*Toxicodendron radicans*) is a perennial, high-climbing, woody vine. Leaves alternate, deciduous, pinnately compound; leaflets

three, thin, bright green, shiny, ovate to elliptic, 2 to 12 cm long, 2 to 12 cm wide, entire to serrate to shallowly lobed. Flowers small, yellowish green, in clusters of two to six in lower leaf axils. Fruit a scarcely fleshy drupe, glabrous to short pubescent, 0.4 to 0.5 cm broad. Found throughout the southern states east of the Mississippi River; most abundant in moist woods but also in pastures, fencerows, roadsides, and waste places.

2. **Poison oak** (*Toxicodendron toxicarium*) is a Low shrub, 0.3 to 2 m tall; very similar in appearance to *T. radicans*; however, it does not climb, and leaflets are thicker, dull green, hairy on both surfaces, broadest above the middle, and often lobed or coarsely serrate. Fruit is densely pubescent rather than glabrous or short pubescent. Found throughout the South; most abundant on relatively dry, sunny sites in woodlands, thickets, and old fields.
 - a) **Toxicity** - The toxic principle is a phenolic compound called urushiol. It is a skin and mucous membrane irritant and is found in all parts of the plant. Some humans are quite sensitive to the effects of the toxin, whereas others show no ill effects from coming into contact with the plant. The toxin has little or no effect on animals, but pets may carry the irritating substance on their hair and thereby transmit it to humans.
 - b) **Symptoms** - Susceptible humans exhibit intense itching with inflammation and the formation of blisters at the areas of contact. Animals are rarely affected. Burning may be dangerous because the irritant may be transmitted by smoke.
 - c) **Treatment** - Consult a physician for proper treatment.
3. **Poison sumac** (*Toxicodendron vernix*) is a shrub or small tree, to 4 or 5 m tall. Leaves alternate, deciduous, pinnately compound; leaflets seven to 13, elliptic to oblong, 5 to 12 cm long, 2 to 5 cm wide, entire, rachis usually reddish and not winged. This species varies from the nonpoisonous species of sumac in that the leaflets are entire and the rachis is not winged; other species have serrate margins or if entire, the rachis is winged. Flowers in panicles in axils of lower leaves. Fruit similar to *T. toxicarium* but glabrous and smaller. Found throughout the southern states east of the Mississippi River but limited in distribution to



very moist areas; in bogs, moccasins, wet pine barrens, and stream borders.

- a) **Toxicity** - The toxic principle is a phenolic compound called urushiol. It is a skin and mucous membrane irritant and is found in all parts of the plant. Some humans are quite sensitive to the effects of the toxin while others show no ill effects from coming into contact with the plant. The toxin has little or no effect on animals, but pets may carry the irritating substance on their hair and thereby transmit it to humans.
- b) **Symptoms** - Susceptible humans exhibit intense itching with inflammation and the formation of blisters at the areas of contact. Animals are rarely affected. Burning may be dangerous because the irritant may be transmitted by smoke.
- c) **Treatment** - Consult a physician for proper treatment.

Chapter III

BOATING SAFETY

A. Introduction and Objectives

To assist the employee in the safe completion of work assignments conducted with boating equipment, Georgia laws set certain standards that must be followed. However, nothing will replace common sense and courtesy on the use of boating equipment. For further information on safe boating see Ref. 5, 6 and 7.

B. General

If a complimentary inspection is requested, a member of the Coast Guard Auxiliary will examine a boat for compliance with Federal regulations and any additional recommendations the local Auxiliary may consider desirable for safety. If the boat passes inspection, a decal will be affixed to the boat. If the boat fails, a confidential list of deficiencies is provided to the boat owner.

Registration numbers are not required for vessels owned by government agencies and used for non-recreational purposes.

The load capacity should be displayed on a plate mounted in the boat. A certificate of compliance for an outboard motorboat will show the manufacturer's rating of maximum engine horsepower for safe use on the boat. A combination capacity plate will also list the maximum number of persons and the maximum weight of persons that can be carried safely, as well as the maximum weight (of persons, motor, and gear) that can be safely carried by the boat. The certificate of compliance and the capacity may be shown on separate plates.

The load-carrying capacity of the boat should not be exceeded. If exceeded, the boat may not handle well, may ride too low in the water, and may take on water over the sides, and swamp or capsize. If rough weather is expected, the boat should be loaded more lightly to let it ride higher and make it less likely to be swamped by waves. If samples are to be collected, their estimated weight should be included in the total estimated weight load.

C. Recommended Equipment

Every motorboat should have a fire extinguisher approved for fighting electrical fires or burning liquids (e.g., gasoline fires). Fire extinguishers must be approved by the Underwriters Laboratories or another reliable testing laboratory. A 2.5 pound dry chemical extinguisher will satisfy the requirement on boats under 26 feet long, but a 6 pound dry chemical extinguisher will offer a greater chance of putting out a liquid fuel fire. Halon extinguishers are as satisfactory as the dry chemical type. An additional fire extinguisher should be located in the fueling area to extinguish fires.

Boats from 16 to 26 feet long must carry audible signals, a whistle or horn that can be heard for at least a half-mile. A police whistle will meet this requirement. Boats from 26 to 40 feet long must carry a bell for use in fog, and a whistle or horn that can be heard for at least a mile. The whistle or horn can be operated by hand or power. Boats over 40 feet long must have a power-operated whistle or horn.

The signaling devices should be used in fog, or in any other weather condition that obscures normal visibility.

Boats with enclosed spaces where spilled fuel or fuel vapors can accumulate must have powers ventilation to clear away the fuel vapors. This requirement does not normally apply to open boats.

Wearable flotation devices (life jackets) are required for each person aboard the boat. Boats over 16 feet long must carry a wearable flotation device for each person, and also one throwable flotation device for the boat.

Although flotation devices of Types I, II, III, IV, and V are approved for field activities, only Types I, II and V are designed to save an unconscious person from drowning, because those are the only types that will turn an unconscious person from a face-down position in the water.

The Type I device is the one that provides maximum flotation, and thus maximum protection in rough water.

The Type V device is a work vest that will float an unconscious person face up. It is designed for work activities, but it is not approved for use on recreational boats and is not available in stores that sell only recreational boating equipment.

Float coats or exposure suits, approved by the Coast Guard, are recommended for cold water operation. Wet suits can also be used, preferably with an additional flotation device.

Visual distress signals are required in boats 16 feet or longer (26 feet for sailboats), and are strongly recommended for any boat that may need a distress signal in any foreseeable circumstance.

- Non-pyrotechnic devices are a special flag (for daytime use) and a special electric signal that flashes SOS signals four to six times a minute, for night use. These devices do not set spilled fuel afire if they are accidentally activated.
- Pyrotechnic devices include hand-held orange smoke signals, floating orange smoke distress signals that last 5 to 15 minutes, hand-held red flares, and pistol-launched parachute red flares. Rocket propelled flares are also available for night use. Pyrotechnic devices should be replaced 42 months from the date of the manufacture, and they are more common on larger boats.

Specified lights are required on any boat that is out on the water in the dark. Boats at anchor must show an anchor light: a white light, visible in all directions for at least one mile. Vessels under way must show at least three lights:

- A white light visible for two miles, in all directions: two white lights are required in international waters, and many boats will show two (or more) white lights regularly.
- A green light, visible from directly ahead through an arc of 112.5 degrees on the starboard (right) side. That 112.5 degree arc marks the zone in which your boat must yield the right of way to other vessels; any vessel that can see your green light has the right of way over your boat.
- A red light, visible from directly ahead through an arc of 112.5 degrees on the port (left) side of the boat. Boats that can see your red light should yield the right-of-way.

It is important to know that, outside of designated shipping channels, sailboats have the right of way over powerboats. Do not expect a sailboat to get out of your way just because it can see your red light. That boat might be becalmed, might have tangled its rigging, or might have run its keel aground.

It is legal, but unwise, to expect very large ships (such as oil tankers) to yield to small boats, and you are required to stay out of their way in a shipping channel.

D. Recommended Additional Equipment

In order to operate the boat with reasonable safety, you will also want to carry:

- a recent chart (or charts) of the area in which you will be boating
- a compass
- paddles or oars
- a boat hook, and
- a bailing bucket or bilge pump

It is also prudent to carry an anchor (and anchor rope), a first aid kit, food and water, a radio with weather band reception, a flashlight, tools and spare parts, and a radio-phone or CB radio for emergency communications. The anchor rope should be seven times as long as the greatest water depth you will encounter. Many types of anchors will work better if a three foot length of chain is attached to the anchor to hold it down in a horizontal position; it holds better that way.

E. Preparation for Boating

Before a boat is taken out for a trip or a long job, it should be inspected to assure that everything works, that lights and motor are likely to keep on working, and that tools and spare parts are adequate and accessible. The Coast Guard Auxiliary has many helpful publications about this and other aspects of boating.

Gasoline is very flammable. There are four basic rules for handling fuel:

- Keep all sources of ignition away from fuel vapors
- Keep the nozzle of the fuel hose in contact with the fuel tank opening to avoid static sparks
- Never overfill the tanks
- Fill portable fuel tanks outside the boat (never in the boat); fill them on the dock or at another location.

Inboard engines require special ventilation equipment. Use it.

Plan your trip. Get the weather forecast; look at the charts and plan your route; collect and weigh the passengers' personal gear, the sampling apparatus, and all other "stores" going aboard. Load the gear so that it will not roll or slide when the boat rocks or tosses. If the weather forecast is somewhat unfavorable, load the boat lightly so that it will float high in the water. If a storm is predicted, postpone the trip. When rough weather can capsize a small boat, it takes quite an athlete to swim home. If your course takes you out of sight of land, at least one person aboard should know how to navigate. At least two people should know how to read charts and locate sandbars, shallows, rocks, rapids, etc. The Coast Guard recommends that you file a "float plan" with someone who can request a search if you do not return as expected. The float plan should give a detailed description of the boat and its planned course to aid a search. It should list the people aboard, the type and frequencies of the emergency radio, and the names and phone numbers of the Coast Guard or other agency personnel who should be notified if you fail to return as expected.

Personal gear should include shoes or boots with anti-skid soles and foot-wear that will be suitable for the sampling or other work to be done outside the boat, if that is part of the plan. Water repellent clothing and sufficient warm clothing should be taken along, and a change of dry clothing is often needed. If water temperatures below 60 degrees F are expected, take a wet suit or other suitable protective, immersible clothing. When one person is in the boat, a second person can pass gear and supplies to the one in the boat. If the cargo being passed over is heavy, watch your (and your boat's) balance! Distribute the weight evenly, and secure all cargo so it cannot move when the boat rocks. Remember to keep the flotation devices accessible – or simply wear them.

Everyone should practice putting on the flotation devices before you set out. Life jackets should be stored so that they can be retrieved quickly and conveniently if the boat capsizes or swamps. If any passenger is a non-swimmer, that passenger should wear a life jacket whenever the boat is in water deep enough to drown in; that includes shallow water in which

holes or depressions may be found. In a stream, the current may undercut a sandbar so that the water may be 8 feet deep 18 inches from the edge of the sandbar.

F. Handling the Boat

At least one person should know how to handle the boat, and that person should instruct the others as quickly as possible. A boat does not handle like any land vehicle. Techniques such as towing, going through locks or dams, and handling the boat in high waves – like the knack of knowing when to stop the motor and how to come in to a dock without hitting it – must be learned by doing. One or more of you must get some instructions in boat handling before you take the boat out. Reading is recommended, but it cannot substitute for hands-on experience.

G. Storm Warnings

Your charts will show the location of storm warning display stations, and your radio will carry weather bulletins.

- A small craft warning means winds may reach 38 mph (33 knots) or conditions dangerous for the sort of boats generally used by DNR. A triangular red pennant displayed at a storm warning display station, signals a small craft warning.
- Two triangular red flags signal a gale warning: winds from 39 to 54 mph (34 to 47 knots).
- A single square red flag with a black center, displayed at a storm warning display station, signals a storm warning: winds of 55 to 73 mph (48 to 63 knots).
- Two square red flags with black centers signal a hurricane or tropical cyclone, with winds in excess of 74 mph (63 knots).

H. Loading and Boarding

When you board a small boat, try to grasp both sides of the boat and then step into the middle. If you put all your weight on the side nearest the dock, you may well push that side under water. If you step down and push the boat away, the boat may move away before you get into it; you may fall in, but at least the boat will not capsize. It helps to have someone else steady (hold) the boat while you step in, but understanding the problem helps even more. One last caution here: it is easy to jump lightly down into the center of the boat and then drop to the opposite side and tip the boat (and yourself) away from the dock. Do not do that either.

I. Rules of the Road

The first International Rules of the road for preventing collision at sea were established in 1889. The U.S. has adopted similar rules for all U.S. waters.

The person in command of the boat is expected to know the rules for operation and navigation, local regulations, and rules of the road. The rules of the road cover three topics: lights; signals used to identify course and position in fog; and action to avoid collision with other vessels. Lights were covered previously in a discussion of equipment.

1. FOG SIGNALS

Fog signals are required if the visibility is obscured – day or night, by mist, fog, rain or snow – in order to avoid collisions. A power vessel must sound one prolonged blast on the whistle, at least every minute. A vessel anchored outside a designated anchorage must ring its bell, or sound its horn or whistle, rapidly for five seconds, at least once every minute. Towing vessels underway must sound a series of three blasts (one long and two short blasts) in succession, once each minute.

2. RIGHT-OF-WAY

The vessel that has the right-of-way is called the “Stand-on Vessel” (formerly, the “privileged vessel”). The Stand-on vessel has a right to maintain its course and speed. It is also a duty to maintain course and speed so that the other vessel can base its actions on known conditions. However, if a collision should become imminent, the Stand-on vessel no longer has the right-of-way or any other privilege.

The vessel that does not have the right-of-way is the “Give-way vessel” (formerly called the “burdened vessel”). When the Give-way vessel approaches another closely enough to create a possibility of collision, the Give-way vessel must slow-turn, or take other position action to keep out of the way.

a. Meeting Situation

In a meeting situation, two vessels are approaching head-on or nearly so, and neither has the right-of-way. Both must alter course to the starboard (right) so that they will pass port to port (left side to left side). A vessel will signal its intent to alter course to the starboard with a “course indication signal” of one or two short blasts of a whistle or horn. The other vessel will return the same signal to indicate understanding and agreement, or will signal four short blasts (danger signal) to indicate its lack of understanding or agreement. (In International Waters, no response is required, and the danger signal is five short blasts.)

b. Crossing Situation

In a crossing situation, when two vessels approach at an angle, the vessel on the right (star-board) has the right-of-way. Your vessel must give way to any vessel that approaches from the 112.5 degree arc in

which your vessel shows its green light at night. The Give-way vessel must slow or alter course to avoid the collision. The Stand-on vessel should maintain course and speed.

c. Overtaking Situation

In an overtaking situation, the overtaking vessel is burdened; it must give way until the overtaken vessel has been passed safely. If the overtaking vessel wishes to alter course and pass to the starboard of the overtaken vessel, the overtaking (Give-way) vessel should give one short signal of whistle or horn. The signal to pass on the port side is two short blasts or whistle or horn. The overtaken (Stand-on) vessel must signal agreement (one or two short blasts) or disagreement (four short blasts).

If you see the white light of another vessel at night, you are overtaking that vessel and must follow the rules for overtaking.

In a narrow channel, your boat should keep to the right side of the channel. When you near a bend, signal to any vessel that may be out of sight by giving a long (four to six seconds) warning blast on a whistle or horn. A small vessel must yield the right-of-way to large, deep draft ships that may not be able to maneuver, or stop, quickly.

In general, right-of-way must be given to sailing vessels, fishing vessels, working vessels, and very large vessels.

J. Navigational Aids

Navigational aids, on navigable waters of the United States, consist of markers, buoys, and lights. They mark channels and constructions, provide direction, and show exact position.

The basic system uses red, triangular buoys or markers, with even numbers, to mark the right side of the channel when the vessel is moving upstream, against the current, returning from the sea (“red light returning”). The other side of the channel (on your starboard side going downstream) is marked with black, rectangular buoys or markers, with odd numbers. In the Great Lakes region, going west, or to the source of the lakes, corresponds to going upstream from the sea. On the Intracoastal Waterway and in coastal water, “upstream” is marked from New Jersey going south to Florida and west to Texas. On the Pacific Coast, “upstream” is from California to Alaska.

On the Intracoastal Waterway, buoys and markers are marked with a yellow band, strip, square, or triangle. The yellow band or square identifies the buoy as being on the Intracoastal Waterway.

Regulatory markers may provide information or given warning (e.g., boat speed restriction).

Lightships or Texas Towers provide warning and guidance in waters that are too deep for other navigation aids. A Texas Tower is a large navigational buoy that has primary and standby generators to operate a high intensity light, a radio beacon, and a fog signal. It also monitors meteorological conditions, air and water temperature, wind speed and direction, and other data. Texas Towers are replacing lighthouses at major harbor entrances.

K. Emergency Procedures

If your boat capsizes, or collides with a solid object or another boat, or if the motor quits, or someone has a medical emergency, you should call for help. Use your radio, whistle, horn, or visual signals. On the radio, send "Mayday" on VHF Channel 16 or 2182 kilohertz. Give the information:

- Boat ID and call letters
- Location
- Nature of distress
- Number of persons aboard and the condition of any that are injured
- Estimated seaworthiness of the boat (how long you may stay afloat)
- Descriptive details of boat; and
- Any other information that may help rescuers find you.

If you have no radio, show visual distress signals. If you have only pyrotechnic distress signals, save them until there is someone out there who can see them.

If your boat capsizes, stay with it. Boats have flotation chambers; they will not sink. If you can right the boat, get into it: that may be warmer than staying in the water. If the water is cold, it is important to conserve body heat. Get out of the water if you can; if you cannot, curl up. If several people are in the water, they should huddle close together.

Do not swim for shore unless it is quite close or there is no chance of rescue. A boat is easier than a swimmer for rescuers to find.

If you hear or see a distress signal, give what aid you can. Use your radio to notify the Coast Guard on VHF Channel 16, or notify any listener on CB Channel 9. There is a "Good Samaritan" clause in the Federal Boat Safety Act of 1971 that protects from liability anyone who provides or arranges towing, medical treatment, or other assistance that any reasonable prudent person would provide under the circumstances.

Chapter IV

BOMB THREATS OR SIMILAR SITUATIONS

Should you receive a bomb threat or other similar threat, you are to follow the procedure as outlined below. These procedures should be followed as closely as possible. If additional telephones are available, other staff may assist in completion of the notifications. The blanks are to be filled in with local telephone numbers preferably in red. This procedure should be kept close to your telephone and your staff should know where it is and how to use it in your absence.

- 1. IMMEDIATELY NOTIFY ALL GUESTS AND STAFF TO VACATE THE FACILITIES.** Guests should be moved to an area of the park where they would be safe and out of range of any explosions which might occur. Assembly area for guests should be designated by the Park Superintendent and staff so advised.
- 2. NOTIFY THE LOCAL SHERIFF _____ AND LOCAL EMS _____.** Request assistance from the local Conservation Ranger of the Law Enforcement Section of the Wildlife Resources Division. The Commissioner or Division Director will notify the Georgia Bureau of Investigation if deemed necessary. The local rescue squad _____, hospital _____, and fire department _____ should all be alerted and asked to stand by.
- 3. NOTIFY THE DIVISION DIRECTOR (OFFICE _____, HOME _____).** If he is unavailable, notify the Chief of Operations (Office _____, Home _____). The Division Director will contact the Commissioner.
- 4. IF THREAT IS BY TELEPHONE, IN WRITING OR VERBAL, YOU SHOULD NOTIFY THE TELEPHONE COMPANY _____ IMMEDIATELY AND REQUEST THAT A TELEPHONE NUMBER TRACING DEVICE BE IMMEDIATELY INSTALLED ON YOUR PHONE TO MONITOR INCOMING CALLS.** Staff receiving calls should be familiarized with the procedures to be followed to trace calls. The Division Director should be consulted by the Superintendent prior to removing the tracing equipment.
- 5. IMMEDIATELY STOP ACCESS OF VISITORS TO THE FACILITY AND SURROUNDING AREAS WHICH HAVE BEEN THREATENED.**
- 6. NOTIFY THE REGION SUPERVISOR _____.** Keep supervisory staff informed as to the status of the investigation and threat.
- 7. REQUEST THE SHERIFF TO PROVIDE A QUALIFIED EXPERT TO SEARCH THE FACILITY, GROUNDS, AND PARK DAM OR DAMS**

FORM EXPLOSIVES OR SIMILAR DEVICES. UNDER NO CIRCUMSTANCES should unqualified individuals attempt to detect and/or move explosive or other threatening devices.

8. **AFTER ALL FACILITIES HAVE BEEN THOROUGHLY CHECKED BY A QUALIFIED EXPERT, THE SUPERINTENDENT MAY AUTHORIZE THE GUEST AND STAFF TO RETURN TO THE FACILITIES.** If a guest desires to leave the facility a refund for the balance of the unused reservation should be made.
9. **COORDINATE ALL NEWS RELEASES AND RADIO AND TELEVISION ANNOUNCEMENTS THROUGH THE COMMUNICATIONS OFFICE, DEPARTMENT OF NATURAL RESOURCES (Phone: 404/656/0772).**

This material and all related material should be kept together if possible so that it will be easy to remove if the office building is threatened. An alternate telephone should be identified for use and a set of procedures kept by them.

Chapter V

ELECTRICAL HAZARDS

Some activities often require Department personnel to reach remote or inaccessible places. In many cases such areas may contain electrical wires or transformers. Great caution should be exercised in these areas. Where practical, power should be cut (turned off) to remove the danger. Where this is not possible, highly conductive equipment such as aluminum ladders, metal probes, and other metal sampling gear should be avoided if possible. Electrical insulating protective gear such as hard hats and gloves should be worn.

Of particular danger are overhead wires. Before raising or carrying ladders, check to see that equipment will clear. If there is danger of contact, do not attempt to enter that area.

Many pieces of equipment require a source of electrical power for operation. In some cases, an electrical power outlet may be some distance away. If possible, arrange for the company to provide power. Long extension cords may be a source of potential overheating and fire if a proper cord size is not selected.

1. GUIDELINES FOR SELECTION OF EXTENSION CORDS

If an extension cord is needed to bring power to equipment or lights, there are important guidelines for selecting a cord that will be safe and serviceable. Extension cords should have three wires, two for power and one to provide a separate grounding circuit for safety. The wires need to be large enough in diameter to carry the needed power over the length of the cord without either significant voltage drop or overheating.

A long extension cord should have large enough diameter wires so that resistance in the cord will not lower the voltage more than 3 percent over the length of the extension cord. If the voltage supplied by the cord is too low, your analytical results may not be accurate and your equipment may not operate safely. Motors can burn out if the supplied voltage drops too low.

The other important requirement for wires is that they be of adequate size to carry the current drawn by your equipment so that the cord does not overheat, damage the insulation, and possibly start a fire. (The current required by your equipment could overload the current carrying capacity of any extension cord having wires of inadequate diameter without tripping the circuit breaker to which your cord is connected. In such a case the circuit breaker will not protect the extension cord from damage.)

Localized overheating can also occur if there is too small an area of contact between any plug blade and its socket connection. The effectiveness of surface contact areas can be estimated by use of a device, which tests the tension provided by the contact blades within an outlet.

The procedure for selecting an extension cord will depend on whether you will use a cord that is available, or whether you will use a cord that is available, or whether you are going to have an extension cord made up for a particular sampling activity.

In both cases you will need to know how much power the equipment you will be using, what the voltage will be at the power source requires, and how far your equipment will be from a power outlet.

The basic steps for assessing or specifying an extension cord are as follows:

- a. First, find the total number of watts required for all of the equipment and lights that you plan to connect to the extension cord.
- b. Find the lowest line voltage that can be expected at the outlet to which the cord will be connected during the time you will be working. You can inquire, test the voltage, or make a rough estimate

If there is no data and the actual voltage cannot be measured on a line with a nominal voltage of 110 or 115, use the value of 100 volts for the calculation of the amperage the wires must carry.

- c. Next find out how many amperes the cord will have to carry by dividing the total number of watts of the equipment to be used by the line voltage expected at the outlet. Watts divided by volts equals the number of amperes of current to be carried by the cord.

$$P \text{ (power)} = i \text{ (amps)} \times v \text{ (volts)}$$
$$i = P/v$$

Electrical cords have a small tag affixed that designates the cord's amperage capacity. Once you have calculated the amps required, compare it with the cord's rating. Never exceed the cord's rating; always go to a cord with a higher rating.

- d. Find out how long an extension cord will be needed to reach from an available outlet to the location of the equipment. Be sure to allow enough length so that the cord can go over or around obstructions or passageways.

2. PRECAUTIONS FOR USE OF ELECTRICAL EQUIPMENT

If electrically powered equipment is to be used, two precautions should be taken. The first is to see that there is no damage to the electrical insulation of the equipment or its cord, and the second is to be sure that any un-insulated electrical conductors or metal parts, which may be "hot" or energized, cannot be touched.

- a. There are four important requirements for electrical cords:
 - (1) Electrical cords should have no breaks in the insulation.
 - (2) Cords should be disconnected from the power source and inspected periodically.
 - (3) Cords should have plugs that keep the terminals insulated and which assure safe connection of wires to the terminals.
 - (4) Continuity of the grounding wire through the electrical cord. If equipment with a grounding wire and a workable three-prong plug is connected to a two-wire extension cord, the grounding wire cannot perform its safety function.

- b. Portable Electrical Equipment

With portable electrical equipment there are three practical steps that can be taken to prevent touching “hot” or energized metal parts. Any one of these steps will provide protection against electrical shock from the equipment:

- (1) Be sure that all exposed metal parts of electrical equipment are connected to an effective grounding circuit, or
- (2) Provide a “Ground Fault Circuit Interrupter” in the line, or
- (3) Use power tools which are “Double Insulated” to prevent any exposed metal surface from providing contact with a “hot” wire.

- c. Grounding Exposed Metal Parts of Electrical Equipment

If electrical equipment is connected to an effective grounding circuit, make sure all exposed metal parts are grounded.

Ungrounded electrical equipment with only a two-wire electrical cord will usually continue to operate even if the hot wire comes into contact with the metal shell or exposed metal parts. If such equipment is held by a person who is also in contact with the earth or some grounded metal object, the individual could be shocked seriously and perhaps fatally.

- d. Ground Fault Circuit Interrupters

If it is not possible to provide effective grounding for portable electrical equipment, “Ground Fault Circuit Interrupters” should be installed to prevent possible injury. When the device detects unbalanced current in a circuit, it will

interrupt the current flow within a few milliseconds and prevent further flow of an injurious amount of current.

Portable ground fault circuit interrupters (GFCI) are available for field use. They are recommended particularly in wet locations where the hazard of current flow to the ground is great. (Ground fault circuit interrupters do have the drawback that they will interfere with operation of any apparatus that uses a capacitor across the line as a noise filter.)

e. Double Insulated Electrical Tools

Electrically powered tools are available with double insulation designed to prevent any exposed metal part from becoming energized and causing a shock to the user.

Electrically powered tools identified by the manufacturer as being "Double Insulated" are considered reasonably safe to use in locations where the user may contact either the ground or grounded equipment. Such tools should be in good condition with undamaged parts. As an additional precaution, such equipment should be checked to see that use or repairs have not damaged insulation and allowed exposed metal parts to come into contact with hot wires.

If new tools or electrically powered equipment ever need repair or installation be sure the power is shut off and the shutoff switch locked so no one can inadvertently turn the power on.

Chapter VI

FIRE PROTECTION

1. Do not smoke around gasoline, oil or grease.
2. Do not store oily rags, because they have the ability to ignite.
3. Do not use cutting torches until the surrounding area has been cleared of combustible objects.
4. Examine objects to be worked on with torches- making sure no combustible materials are connected to the object.
5. Do not use any type of flame around wood chips and sawdust.

WHAT TO DO AFTER YOU CALL THE FIRE DEPARTMENT:

- A) ELECTRICAL FIRES
 1. Unplug appliance or remove fuse or circuit breaker
 2. Use CO2, foam or dry powder extinguisher.
 3. Never - Use Water
- B) CAR FIRES
 1. Stop car at first safe place
 2. Shut off engine
 3. Disconnect battery if possible
 4. Use CO2, foam or dry powder extinguisher

Fire Extinguishers

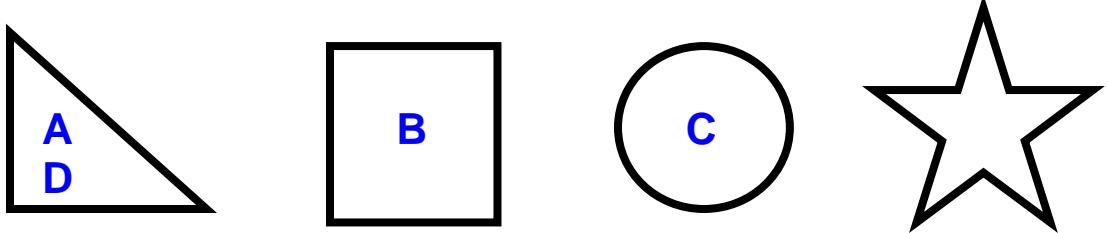
Fire extinguishers should be mounted in the following locations;

1. Offices
2. Maintenance Areas
3. Kitchens
4. Adjacent to fuel tanks
5. Overnight facilities
6. Meeting facilities

In addition, fire extinguishers must be installed in all motorboats and motor vehicles. These should be inspected every six months and replaced as needed. Instructions for their use are on each extinguisher. Every employee should be familiar with both the location and the use of all extinguishers.

FIRE EXTINGUISHER TYPES

- A) Basically there are four types of fires: Class A - those, which occur in materials such as wood, paper, rubbish, and rags. Class B - those that occur on the surface of grease, gasoline, oil, thinners and paints. Class C - fires in or near electrical systems. Class D - fires that occur in or around combustible metals such as titanium and magnesium. Each class of fire has a certain type of fire extinguisher that must be used to put out the fire. Fire extinguishers are classified just as fires are classified. Example: a type A fire extinguisher will put out a type A fire (combustibles). A fire extinguisher may be classified as being able to put out more than one class of fire. Example: a fire extinguisher rated ABC is capable of putting out Class A, B, or C fires (combustibles, flammable liquids and electrical). The right type of fire extinguisher, for each class of fire possible in an area, should be present. Extinguishers should be located close to potential fire hazards, but not so close as to be trapped in the fire.
- B) Each class of fire has its own identifying symbol. These symbols will be located on the extinguisher with the class letter (A, B, C, or D). Thus, enabling the user to determine if the extinguisher is capable of extinguishing the fire at hand:



1. TYPE-A WATER

- a) Either pump type, or soda acid, where you invert tank to energize.
- b) Water hose or Pail of Water
- c) Extinguishes by cooling the fuel
- d) Not Use on Electrical, -grease, liquid or automobile fires where the water will probably spread the fire.

2. TYPE-B FOAM

- a) Extinguishes by smothering and cooling.
- b) Usually operated by inverting.
- c) Very fine for grease and liquid fires.
- d) Not recommended for electrical fires.

3. TYPE-C CO₂

- a) Extinguishes by smothering the fire.

- b) Usually operated by a squeeze valve.
- c) The CO² is heavier than air and keeps oxygen from heat.
- d) Excellent for grease, liquid, or electrical fires.

4. TYPE-D DRY CHEMICAL

- a) Extinguishes by blanketing fuel with powder-heat turns to gas (inert)
- b) Usually operated by a squeeze valve.

Excellent for grease, liquid, or electrical fires (automobile fires)

Chapter VII

EMERGENCY FIRST AID FOR FIELD ACTIVITIES

1. INTRODUCTION

Every person who engages in field activities should be able to recognize injuries and exposures that require immediate emergency action. Most injuries and illnesses are not life threatening, but it is important to recognize those that are and be prepared to take emergency action to prevent serious consequences or death.

In many field activities, DNR personnel can receive injuries or chemical exposures that could cause serious illness or death unless immediate action is taken to control the emergency. If DNR personnel are remote from immediately medical emergency treatment, they will have to depend on the training and preparation of other members of their team.

DNR employees should have knowledge of first aid and cardiopulmonary resuscitation. CPR training is available through the American Red Cross, American Heart Association, and at local fire stations.

Every DNR employee engaged in field activities should carry a wallet card with important medical information such as blood type, allergies, medication being taken, and any physical condition, which may cause a problem in regular activities or emergency situations.

This section will describe medical emergencies that may occur in field activities, describe the general course of action for any type of medical emergency, and review the procedures for treating such emergencies.

This section does not take the place of a first aid course or hands-on training in first aid, chemical splash procedures or CPR. This section does, however, emphasize a different range of emergencies than a basic Red Cross first aid course.

2. BACKGROUND

a. Serious and Life-Threatening Medical Emergencies

Medical emergencies may occur during field activities as a result of accidents, work stress, individual medical conditions, or exposure to toxic or corrosive chemicals. Nine different conditions are so serious that they are considered life threatening. Three conditions in particular require immediate action because death will result in minutes if no effort is made to help the victim.

The three medical emergency conditions that require immediate action to prevent death are listed in ascending order of their seriousness:

- Bleeding severely
- Breathing stopped
- Circulation stopped.

Bleeding severely from traumatic injuries can lead to an irreversible state of shock in which death is inevitable.

Breathing can be stopped because of:

- An obstructed airway
- Allergic reactions to insect stings
- Drowning
- An electrical shock
- Exposure to an oxygen-deficient atmosphere
- Exposure to a toxic gas with immediate paralytic effects

Circulation can be stopped because of:

- Heart attach
- Electrical shock
- Paralysis from chemical exposure

If a victim is unconscious, it is important to determine if he has stopped breathing, if the victim's heart has stopped beating and circulating blood throughout the body, or if the person is suffering from some other life-threatening emergency. Always check for an open airway, breathing and circulation.

Other medical emergencies which are extremely serious, or which can become life-threatening, include:

- Traumatic injuries to head neck or back
- Shock resulting from injuries
- Over-exposure to heat or cold
- Thermal burns that are deep or extensive
- Inhalation of toxic gas
- Chemical contact that is concentrated or extensive.

b. General Emergency Procedures

When a person is seriously injured or exposed to large amounts of hazardous chemicals, there are three activities that must be carried out quickly. These activities can be carried out by one person, but if several people are available it is much more effective if all three activities can be carried out at the same time:

- Size up the Scene.
 - Perform an initial assessment.
 - Summon advanced medical personnel.
- c. Size up the Scene.
- a. Determine if the scene is safe for you, other rescuers, the victim(s) and any bystanders.
 - b. Look for dangers, such as traffic, unstable structures, downed power lines, swift moving water, violence, explosions or toxic gas exposure.
 - c. Put on appropriate personal protective equipment.
 - d. Determine the mechanism of injury or nature of illness. Try to find out what happened and what caused the injury or illness.
 - e. Determine the number of victims.
 - f. Determine what additional help may be needed.
- d. Perform an initial assessment to identify any life-threatening conditions.
- Check the victim for consciousness and obtain consent if the victim is conscious.
- a. Check for signs of life (movement and breathing).
 - b. Check for a pulse.
 - c. Check for severe bleeding.
- e. Summon advanced medical personnel if you find any of the following life-threatening conditions.
- a. Unconsciousness or disorientation.
 - b. Breathing problems (difficulty breathing or no breathing).
 - c. Chest discomfort, pain or pressure lasting more than 3 to 5 minutes.
 - d. No pulse.
 - e. Severe bleeding.
 - f. Persistent abdominal pain or pressure.
 - g. Suspected head, neck, or back injuries.
 - h. Severe allergic reactions.
 - i. Stroke (weakness on one side of the face, weakness or numbness in one arm, slurred speech or trouble getting words out).
 - j. Seizures that occur in water.
 - k. Seizures that last more than 5 minutes or cause injury.
 - l. Repeated seizures (one after another).
 - m. Seizures involving a victim who is pregnant, diabetic or who does not regain consciousness.

- n. Vomiting blood or passing blood.
- o. Severe (critical) burns.
- p. Suspected broken bones.
- q. Suspected poisoning.
- r. Sudden severe headache.

Call first or care first? If you are alone, you will have to decide whether to call first or care first.

Call first means to call for advanced medical personnel before providing care. Always call first if you suspect a cardiac emergency – a situation in which time is critical. Examples include sudden cardiac arrest or the sudden collapse of a child that has been witnessed. In these situations, call first. Next obtain an automated external defibrillator (AED) if available and then return to the victim to use the AED or begin CPR if an AED is not available. Also, call first for –

- s. An unconscious adult (12 years or older).
- t. An unconscious child or infant known to be at high risk for heart problems.

Care First situations are likely to be related to breathing emergencies rather than cardiac emergencies. In these situations, provide support for airway, breathing and circulation through rescue breaths and chest thrusts, as appropriate. Care first, that is provided 2 minutes of care, and then summon advanced medical personnel for—

- u. An unconscious infant or child (younger than 12 years old).
- v. Any victim of a drowning or nonfatal submersion.
- w. Any victim who has suffered cardiac arrest associated with trauma.
- x. Any victim who has taken a drug overdose.

Someone must administer first aid to reduce the severity of any life-threatening medical emergency. This person should have recent first aid training and practice. If there is no one available with recent training, a team member can carry out the most important steps guided by a first aid manual. Be sure that a good manual is available in a readily accessible location. The American Red Cross Standard First Aid and Personal Safety Manual is an excellent reference (ref. 3). Another good reference is the American Academy of Orthopedic Surgeons manual Emergency Care and Transportation of the Sick and Injured (ref. 4).

First aid is generally defined as the immediate and temporary care given the victim of an injury or sudden illness until medical assistance can be obtained. In this section the term “first aid” is used to include any immediate and temporary care, including chemical splash treatment and cardio-pulmonary resuscitation. The objectives of first aid are to:

- Care for life-threatening conditions
- Minimize further injury and complications, such as infection
- Obtain medical assistance

e. Arranging for Transportation

Someone must arrange for medical assistance for further treatment of serious medical emergencies. Medical assistance can be obtained in some areas from paramedic teams from local hospitals or fire departments. In other areas, medical assistance can be obtained most readily by taking the injured person directly to a medical treatment facility such as a hospital.

Find out in advance how to call for medical assistance and how to reach the emergency medical facility. Have a map and directions readily available and make a practice run if your field activities are particularly hazardous.

In many cases, you will care for the person where you find them. Do not move the victim unless it is necessary. Move an injured victim only if –

- The scene is unsafe or becoming unsafe.
- You have to reach another victim with a more serious injury or illness.
- You need to provide proper care (e.g., someone has collapsed on a stairway and needs CPR, which must be performed on a firm, flat surface).

If necessary to transport an injured person to a medical facility, try not to complicate the injury or subject the victim to unnecessary discomfort. If necessary to transport an injured or ill person without the assistance of specially trained personnel, there are some important considerations before starting to move the person. If the medical emergency is one in which movement can cause further injury, be sure that the move is planned and carried out so that it does not harm the injured person more than waiting for help. If the emergency is one that requires uninterrupted treatment, such as cooling thermal or chemical burns, plan the movement so that the emergency treatment can be continued. If the emergency resulted from a chemical splash, be sure that preliminary washing has been thorough enough to minimize the injury and to prevent serious contamination of other people. Reference 3 Chapter 15 and reference 4 Section XI contains supplementary information on emergency transportation.

a. Medical Emergency Supplies

Every vehicle should be equipped with a first aid kit and supplies for emergencies likely to be encountered. In cold or wet weather, the team should have blankets and supplies needed for treating cold stress, and in hot weather the team should have water or replacement fluids needed for prevention and treatment of heat stress. (See Section H of this chapter for more information.) If the team may be exposed to contact with hazardous chemicals, their vehicle should be equipped with a pressurized supply of potable water that can be used for flushing chemicals from the eye and body in case of splash. The volume of the pressurized water supply should be at least eight gallons. (The water can also be used for washing skin areas that may be contaminated during field operations.)

References 3 and 4 provide detailed information on the three life-threatening emergencies that can occur during field activities; severe bleeding, stopped breathing, and stopped circulation, as well as many other related topics.

b. Emergency Treatment for Inhalation of Toxic Gas

The first step in emergency treatment for inhalation of toxic gas is to get the exposed person out of the toxic atmosphere, without exposing anyone else, or yourself multiplying the problem. Unless the toxic gas exposure was the result of a sudden localized leak or a passing cloud of gas (a transient exposure), rescue will require two people equipped and trained to use self-contained breathing apparatus. In some very unusual atmosphere that might exist within a chemical plant, fully encapsulating suits may also be required for safe rescue.

Death or serious injury may be prevented by removing the exposed person from the exposure area and by providing mouth-to-mouth resuscitation. If there is an antidote for the chemical exposure, it should be available if there has been adequate preparation.

Once a person exposed to a toxic gas or vapor has been removed from the exposure, it is safe to administer mouth-to-mouth resuscitation. Use some form of breathing barrier, which include resuscitation masks, face shields, and bag-valve mask resuscitators. There will be very little gas or vapor in the respiratory system of the exposed person and what there is will be exhaled gradually (in dilute concentrations) only after the rescuer has forced air into the victim and taken his mouth away from the victim's mouth.

Inhalation of a few breaths of concentrated toxic gases or vapors, of some chemicals, is likely to be followed by almost instantaneous collapse and cessation of breathing (examples are hydrogen sulfide and hydrogen cyanide). However, even if breathing stops because of such an exposure, the heart will usually continue beating for some time. Therefore, immediate mouth-to-mouth resuscitation and emergency medical treatment are very effective in preventing death.

If a person exposed to a toxic gas or vapor is not breathing, give mouth-to-mouth resuscitation (or some other form of artificial respiration) until normal breathing resumes or until a resuscitator is available. If a toxic liquid has been splashed in the victim's face, wash it off quickly before you begin mouth-to-mouth resuscitation.

Continuing emergency treatment of a person exposed to a toxic gas or vapor should include treatment for shock and keeping the exposed person as quiet as possible. Do not give the exposed person any alcoholic beverage.

c. Emergency Treatment for Chemical Contact by Splashes

Chemicals in contact with the eye and skin can cause serious or life threatening emergencies that must be treated quickly. One drop of corrosive chemical in an eye can cause permanent blindness, and splashes of corrosive chemicals on skin can cause permanent tissue destruction. Some chemicals splashed on a large portion of the body can cause death if they are not washed off quickly.

Washing splashed chemicals from the eyes and body is the most important emergency treatment. It takes precedence over seeking medical assistance.

If chemicals come in contact with the eyes or body, flush the chemical off quickly and as thoroughly as possible. Use copious amounts of potable water and wash for at least 15 minutes. Splashes of hot, concentrated or corrosive chemicals will usually require washing for a longer period, up to several hours. In case of chemical splashes in the eyes or on more than a small area of the skin, emergency treatment by flushing with water should always be followed by medical examination. Make sure that the medical facility knows as much as possible about the chemicals splashed or contacted, particularly if the chemical may have been absorbed, so that further diagnosis and treatment are provided as needed. (There have been deaths as the result of material absorbed from massive splashes with chromates and nitrates).

(1) Emergency Treatment for Chemical Splashes in the Eyes

The most important emergency measure, if chemicals are splashed in the eyes, is immediate washing of the eyes with large quantities of potable water. To wash the eyes and exposed surfaces effectively, hold the eyelids open and try to get the injured person to roll his eyes while you are irrigating with water. The eyes and the inside of the eyelids should be washed for at least 15 minutes before any effort is made to go to a medical facility for follow-up treatment.

Immediate washing with water is essential, and only a few seconds delay can result in some permanent damage. Washing the eyes thoroughly is more important than reaching a medical facility, and

washing should not be delayed for any reason. A victim should be transported for medical attention only after a thorough washing.

Chemical burns to the eyes may be aggravated by soft or extended wear contact lenses that can accumulate some chemicals. Hard contact lenses may complicate effective irrigation of the eyes, even though they may not aggravate a chemical injury.

Eyes should not be irrigated with any neutralizing agents as an emergency treatment. Any neutralizing solution is less effective than plain water, because of the physiological characteristics of the eye. Any acid in a neutralizing solution will tend to react with the protein in the cornea to form an insoluble barrier that will prevent washing out of any alkaline solution trapped under the barrier. Medical tests have shown that washing with potable water is the most effective emergency treatment available in field situations.

(2) Emergency Treatment for Chemical Splashes on the Skin

The most important emergency measure, in the event chemicals are splashed on the skin, is immediate washing with large quantities of potable water. To keep chemicals splashed on clothing from being washed through the cloth or onto the skin, remove splashed clothing and wash the chemicals from skin with large quantities of water. Speed and thorough washing are important to reduce the extent of injury.

If the chemical has been splashed on the victim's face or inhaled, it will be important to see that there is an open airway so the victim can breathe.

Remove all contaminated clothing and shoes, and all clothing that may accumulate contaminated wash water. In case of a splash on the body, it will usually be necessary to remove all clothing.

Removal of splashed chemicals can be accelerated through use of a washcloth and/or detergent. In no case, however, should any attempt be made to neutralize splashed chemicals.

Since washing chemicals off of a person will dilute and spread the chemicals, rescuers should recognize the potential spread of contamination to themselves and the immediate environment. If gloves and protective clothing are available within a few seconds the rescuers may want to wear the protection to reduce contact with splashed chemicals. After the victim has been washed, rescuers will have to wash themselves to prevent any injury from chemicals washed off the victim.

The cold water from a hose or safety shower will reduce chemical activity and burning during the initial 15-minute flushing. For prolonged washing it will be desirable to find a source of water in which the temperature can be adjusted to prevent traumatic shock.

If the area of chemical contact is extensive or the period of washing has to be prolonged, the victim will have to be treated for shock. If the splashed person is conscious and can swallow, give them plenty of nonalcoholic liquids to drink.

Chemicals in contact with the eye and skin can cause serious or life threatening emergencies that must be treated quickly. One drop of corrosive chemical in an eye can cause permanent blindness, and splashes of corrosive chemicals on skin can cause permanent tissue destruction. Some chemicals splashed on a large portion of the body can cause death if they are not washed off quickly.

Washing splashed chemicals from the eyes and body is the most important emergency treatment. It takes precedence over seeking medical assistance.

Chapter VIII

HANDLING MATERIALS

1. Inspect the material to spot any jagged edges, slivers, burrs, rough or slippery surfaces.
2. Have a firm grip on the material.
3. Keep hands free of oil and grease.
4. Before lifting materials, make sure the object is not greasy, wet or slippery.
5. When handling lumber, pipes and other long objects, keep hands away from the ends to prevent them from being pinched or otherwise injured.
6. Remove all jewelry from hands and arms (rings, bracelets, etc.) before lifting materials.
7. When lifting heavy objects, lift with your legs and not your back. Always seek help with heavy object.

Chapter IX

HEAT, COLD AND NOISE STRESS

Field personnel often experience a variety of problems and discomforts. By careful training and preparedness many of these problems can be circumvented or prevented. In the case of adverse weather conditions, personnel must rely on careful preparation before going out in the field. Early recognition of signs of weather related health problems and a well-organized and rehearsed emergency treatment program are needed.

1. HEAT STRESS

We warm-blooded animals maintain a very precise body temperature. A slight deviation from the normal 98.6° F internal temperature can dramatically alter the behavior of the body and its functions. As external temperatures are increased, heat due to metabolism increases internal temperature and the body responds by working to reduce the unwanted heat. The result is increased heart rate, body temperature, respiration perspiration or heat stress. This additional burden on the body functions can result in a variety of adverse health effects ranging from cramps to collapse and even death.

a. Causes

Heat stress is caused by external heat sources such as high ambient air temperature and direct sunlight, or internal body heat build-up resulting from heavy work or prolonged use of such protective gear as encapsulating suites.

External Heat Sources – Advanced planning and preparation will lessen the chance of adverse health effects from high temperature. Work that requires long hours in the sun should be scheduled, if possible, at a time of the year when temperatures are moderate. If the work must be done during the hot season, daily scheduling should be arranged so that most of the strenuous work or work in direct sunlight, can be accomplished in the cooler morning or evening hours.

If possible, investigate ambient air temperatures before scheduling work. At some industrial sites, heat-generating processes may shut down during certain times of the day.

Other external factors such as high humidity and altitudes may increase the effects of heat on the body.

Internal Heat Sources – Many factors may affect the amount of heat generated by the body. Human factors such as inadequate

acclimatization, fatigue, physical condition, the effects of alcohol consumption, cardiac and respiratory conditions and some medications can all increase body stress under high temperatures. Before DNR personnel are assigned work requiring exposure to some form of heat stress, systemic diseases or other physical problems should be carefully considered before the employee is assigned to a team working in high stress areas.

b. Preliminary Assessment

The following factors should be considered before committing Department personnel to an area of potential high heat stress:

- Normal ambient air temperatures for the time personnel will be at the site
- Forecast winds and humidity
- Human factors such as medical problems, accumulation and physical condition of the crew
- Exposure to direct sunlight
- Proximity of additional heat sources such as vats, stacks, or pipes
- Required use of heat retaining equipment such as encapsulating suits, respiratory gear, rain gear or disposable suits, etc.
- Overall work load such as lifting and climbing
- Acclimatization of team members

c. Emergency Information

Once a site activity has been scheduled, advance preparations should be made in the event of an emergency problem. The following steps should be taken:

- Locate your exact position on a map or site plan. Be sure you can give adequate directions to ambulance or emergency crews
- Determine the exact location of the nearest emergency treatment center. In case an emergency vehicle is not available, be sure you know how to find the emergency center

- Find the phone numbers of any emergency center, emergency crew and ambulance
- Locate a source of water for emergency cooling or a room that is air-conditioned
- Make sure at least one member of the team is well versed in emergency first aid for heat and stress victims.

d. On-Site Work Schedules

Plan to arrive early in the morning while it is relatively cool. Lifting and hauling should be done immediately.

If work is to be done during the heat of the day, in the hottest months of the year, be sure to include time for adequate rest periods. Rest gives the body an opportunity to rid itself of accumulated heat, slows production of internal body heat and provides greater blood flow to the skin for cooling.

If respiratory equipment or encapsulating suits will be worn without cooling vests when ambient temperatures are expected to be over 90° F, schedule work periods of only 15 to 20 minutes at a time. Factors such as the exact type of suit worn, provision of cooling devices, amount of direct sun and the amount of physical activity involved, will affect the maximum working time at any ambient air temperature.

e. Equipment and Supplies

Careful planning in bringing the right equipment and supplies cannot only reduce workloads (and the resulting generation of internal body heat) but can also protect against or prevent the exposure that leads to heat stress.

The following equipment and supplies should be considered when heat stress is a possibility:

- A reliable air thermometer for continuous surveillance of ambient air temperatures
- An oral fever thermometer for surveillance of internal body heat
- Block and tackle for hoisting heavy equipment
- A large beach type umbrella or tarpaulin to protect personnel from direct sunlight

- Protective heat shields, insulating or reflective materials for intense heat areas
- Electric fans, blowers or other ventilating equipment
- Large insulated containers of cool liquids both for drinking and cooling
- Towels, blankets, sponges, and a plastic basin for emergency cooling procedures
- First aid kit
- Emergency communication equipment for use between ground crews and those at locations such as smoke stacks, pits, boats or remote areas
- Body replacement fluids containing salts or other electrolytes that are lost during perspiration. Two to three gallons per day per individual of a solution of Gatorade, ERG, Squincher, or salt water made up of 1 teaspoon per 5 quarts of water are required.

f. Clothing

In general, clothing should be selected to reduce heat load. It should be light in color and reflective. In direct sunlight special precautions should be taken to cover the head and wear shatterproof sunglasses. When ambient temperatures are below 100° F, clothing should be loose fitting, porous and preferably made of cotton rather than synthetics or wool. If ambient temperatures exceed 100° F, loose fitting clothing covering all exposed skin areas should be worn.

g. Preparations for Emergency Treatment

The possible effects of heat stress should be taken as seriously as any other life-threatening hazard. Field teams should be trained to quickly recognize the symptoms and react accordingly. Heat stress victims should be tended to as quickly as possible. If help is more than 10 minutes away, team members should administer first aid.

Vital information such as location and phone number of emergency help, description of team location and pertinent medical information of team members should be in a centrally located place such as a vehicle.

and tackle should not only be brought to the site but made readily available to crews that might need them.

h. On-Going Evaluation

Ambient conditions are subject to change during a working day. Conditions such as temperature, humidity and wind should be monitored throughout the day at regular intervals. As conditions change, increased vigilance for signs of heat stress will be necessary.

In situations where it is necessary to be on the site for more than one day, changing ambient conditions require a careful evaluation of the need for replenishment of supplies and new equipment. Assign the task of equipment and supply evaluation to one responsible member of the team.

If possible, two team members should be given the responsibility of visually monitoring other members for signs of heat stress. When one of the responsible members is in doubt, consultation with the other observing member should be held. Visual checks should be made and recorded at predetermined intervals. Everyone should be reminded of the necessity to replace lost body fluids on a regular basis. It is recommended that under heat stress, personnel should drink every 15 minutes to one hour depending on the heat load. Under extreme heat conditions, oral temperatures should be taken and recorded at breaks to detect the onset of heat stress problems.

i. Recognizing the Symptoms of Heat Stress

Heat stress manifests itself in four disorders. From the most severe to the least severe, they are:

- Heat stroke
- Heat syncope (fainting)
- Heat exhaustion
- Sunburn

References 3 and 4 contain detailed information on emergency first aid procedures for the above disorders (see end of chapter).

(1) Heat Stroke

Symptoms – Heat stroke is a medical emergency. There is a clear history of heat exposure or heavy exertion in the heat. In the earlier stages, the skin is flushed and the person is sweating; however, in the more severe and late stages, sweating may stop totally and the face may

have a pinkish or ashen hue. The symptoms are usually progressive depending on the severity starting with faintness, dizziness, staggering, headache, nausea, vomiting and unconsciousness. The temperature is high, reaching 104° F or above, and the pulse rate is usually 140 per minute or higher. The high fever is the most consistent indication of a heat stroke.

Treatment – Treatment of a heat stroke should begin at once. The primary aim is to lower the body temperature. Cooling methods in ascending order of effectiveness are wet towels and a strong fan, ice bags over much of the body or a tub bath of cold tap water. Get in contact with a physician as soon as feasible and on the way to the hospital the cooling process should be continued with wet sheets, ice bags, etc.

(2) Heat Syncope (Fainting)

Symptoms – A person who becomes dizzy or suddenly tired after exercising in the heat may abruptly faint. In contrast to a patient with a heat stroke, the person with heat syncope has a cool, sweaty, pale skin. His pulse is usually weak and not as rapid as in a heat stroke.

Treatment – Treatment is a matter of allowing the person to rest, cool down and drink extra fluids.

(3) Heat Exhaustion

Symptoms – Heat exhaustion takes much longer to develop than heat syncope – usually several days. Heat exhaustion results from sweating with resultant loss of body fluids and salt. The symptoms are thirst, muscle cramps, fatigue, dizziness, nausea and finally delirium depending on the severity of the heat exhaustion. The body temperature is elevated, but not nearly so high as in heat stroke.

Treatment – Treatment is resting in bed away from the heat and drinking as much fluids as possible. These fluids should contain body salts, such as those given to football players in the summertime.

Prevention of heat exhaustion is a matter of drinking enough fluids to replace losses from sweating which may be as high as six quarts a day in men working in hot, humid conditions. Usually, a good diet will furnish all of the salts the body needs, but in extreme cases of heat and high humidity, one should put a little more salt in their food or in one or more of their fruit drinks. If one has been placed on a salt-restricted diet, they should check with their physician before increasing the amount of salt intake.

The best treatment for these three conditions is prevention. Remember the old axiom “an ounce of prevention is worth a pound of cure”. Be heat conscious and observe associates while on vacation, especially older people who are more susceptible to heat disorders and children who are not so knowledgeable of what the heat and high humidity will do to them. **Be heat conscious.**

Lotion and ointments come in various degrees of protection. Fair skinned employees, or those being exposed for the first time, should use maximum protection. The level of protection can be gradually reduced as the skin tans.

Over time, heavy sweating can reduce the protection levels of ointments and lotion. If extremely active, one should reapply sunscreen approximately every hour.

Remember, the sun's ultraviolet rays can penetrate thin layers of cloud. Sunburn protection should be worn, even on days that are lightly overcast.

2. COLD STRESS

DNR personnel are sometimes required to perform fieldwork in cold weather. Such weather conditions can lead to severe health problems ranging from skin injury, frostbite and even death due to hypothermia. Adequate planning and preparation must be taken prior to exposure in cold weather conditions.

a. Causes of Cold Stress

The human body functions normally within a very narrow range of internal body temperatures. Although the body is capable of compensating for some heat loss in a short period of time, a drop of only 5 degrees of internal body temperature usually results in disruption of normal activities. To prevent this sudden loss of body heat, DNR personnel should recognize the ways in which heat can be lost.

Radiation

Radiated heat loss from exposed skin areas can account for as much as 25% of the body's heat loss. Prevention of radioactive heat loss is primarily by insulation, such as hats, gloves and thermal underwear.

Conduction

Conduction is heat lost to other objects; ladders, metal surfaces, wet clothing, snow, ice or water, all result in the quick loss of heat. Care should be taken to wear waterproof gloves and clothes when near wet surfaces. Gloves should always be left on during contact with highly conductive materials. Clothes that are wet should be dried or changed immediately.

Convection

The loss of heat due to circulating air can be substantial. In many areas weather forecasts include a “chill factor”, the estimated effect of wind on the body. The wind chill index allows you to estimate the equivalent temperature based on the thermometer reading and wind speed. By determining the wind chill, judgments can be made for scheduling field activities and the amount and type of clothes to be taken. To prevent convective heat loss, wind-proof gear such as rubber, vinyl or poplin should be worn. Some “coated” nylon fabrics (e.g., Goretex, Helly Tech, etc.) are waterproof yet allow perspiration to escape, making them ideal for active field personnel.

Evaporation

Evaporation is an effective natural cooling process. Moisture for evaporation can come from general sources such as rain or snow or internal sources such as perspiration. External evaporation can be prevented by waterproof gear. The same waterproof gear can also minimize heat loss due to evaporation or sweat. Evaporation of sweat can also be reduced by wearing highly absorbent clothing next to the skin (e.g., polypropylene layer next to skin to “wick” moisture to wool shirt).

b. Human Factors Contributing to Cold Stress

The following factors can contribute to cold stress:

- Cardiac or respiratory conditions
- Fatigue or lack of acclimatization
- Inadequate sleep, food or water
- Dehydration

When working as a team, the team leader should be aware of team member general physical condition with respect to these factors.

c. Preliminary Assessment

Although little can be done about the weather, advance planning and preparations can spell the difference between worker hardships and reasonably comfortable working conditions.

The team leader is responsible for scheduling. The leader should assess weather conditions carefully for the period Department personnel will be at the site. The possibility of high winds, low temperatures, snow, or rain must be carefully weighed before field-work is scheduled.

On-site conditions, such as exposure to the elements/shelter needs, warm food/drinks and drinking water availability must be considered versus predicted weather conditions.

d. Availability of Team members

If continuous work is required, consideration should be given to assigning enough personnel to allow alternating shifts. One team would be on the cold shift while the other rests in a warm shelter or equal. Carbon monoxide poisoning and asphyxiation are always a danger when vehicles or heaters are used. Care should be taken to ensure adequate ventilation where these alternate heating sources are used.

e. Preparation for Cold Weather Work

Prepare a checklist of required clothing, supplies, and equipment needed for anticipated conditions. Arrange for temporary shelter if none exists at the site. Arrange and discuss emergency plans for treatment and evacuation if necessary. Prepare for scheduling changes if prevailing weather conditions vary during field activities. Carry a portable radio or monitoring equipment to keep track of changing weather conditions. Provide communication equipment such as two-way radios or telephones. Schedule activities to make maximum use of the warmer daylight hours. Make allowances in scheduling for the extra time and added fatigue of heavy clothing. Monitor weather and the physical condition of team members on a regular basis. Prepare for a worst-case scenario for the involved field activity.

f. Selection of Clothing for Cold Weather Work

The proper selection of clothing is the best possible defense against cold stress. Clothing should be selected with three factors in mind:

- Insulation value
- Absorption ability
- Wind resistance

Studies have shown that multiple layers of clothing have more insulating volume than single thick layers of equal thickness. Each layer traps air between it and the next layer to provide effective insulation. Multiple layers also have the advantage of being removed one at a time as weather conditions or workload may dictate. Inner layers should be porous to wick away moisture from the skin. Intermediate layers should be of good insulating properties such as wool, goose down and any of the new synthetics (e.g., Polar fleece). Outer layers would be non-porous, wind and waterproof.

Be sure to give special consideration to covering the head, hands and feet, the three areas of the body most susceptible to cold injury.

Heat loss from the head may account for up to 25% of the entire body's heat loss. Head covering should be well lined and loose fitting with a means of protecting the ears. Since personnel are at times exposed to high winds, a way of securing headgear should be considered. Hard hats are often inadequate for heat loss protection. Insulating head protection should be selected to accommodate hard hats if required.

Protection for hands and feet should be selected with the same properties in mind as head protection, well insulated but loosely fitting. Warm mittens with water resistant covering are the best, although gloves may be required for dexterity. Insulated boots, in a size larger than normally worn during warmer weather, will allow for air space insulation and multiple layers of socks. Boots should be made of waterproof material such as rubber or leather treated with waterproofing. Soles should be designed for sure footing on slippery surfaces or in snow. Always carry extra pairs of dry socks and gloves. Wet gloves or socks quickly lose their insulation value and can materially add to body heat loss. Wet socks or gloves should be changed immediately.

g. Recognizing and Treating Cold Stress Disorders

- Hypothermia
- Frostbite

References 3 and 4 provide detailed information on symptoms and emergency first aid procedures for cold stress disorders. The following table details the effects of heat loss on the body.

If, for example, a person falls overboard or is forced into the water from a boating accident, they should not panic or fight the water. They should hang near the boat unless it is in danger. When swimming becomes necessary, they should swim slowly and easily to conserve strength. Any item that floats will help keep one afloat. Floating debris is easier to see than a person in the water. Again, stay with the boat unless it is impossible to do so.

Sudden immersion in cold water can be very painful, cause rapid, uncontrolled breathing, cardiac arrest (heart stoppage) and other problems. This may cause a person that falls in the water to go under and never come up again – alive. Wearing a PFD is the only defense. If a person must enter the water they should button up their clothing, wear a PFD, and enter the water slowly.

Hypothermia is when the body loses heat faster than it can produce it. This causes a dangerous reduction of the body's inner temperature. Hypothermia results from exposure to wind and wetness. A victim of hypothermia may become blue-gray in color. Violent shivering develops which may give way to muscle spasms and even loss of the use of the arms and legs. Confusion and drunken behavior also indicate that a person may be hypothermic.

To protect against hypothermia, one should avoid the conditions that cause it. They should dress warmly and stay dry by putting on rainwear before it rains and wearing a wool jacket. Wool traps body heat even in cold weather. It may be 50° F (7° C) outside with the sun shining, but a 10 m.p.h. wind lowers the temperature to 28° F (minus 2° C), a 20 m.p.h. wind lowers it to 18° F (minus 7° C).

Hypothermia Chart

If the water Temperature (f) is ...	Exhaustion or Unconsciousness	Expected Time of Survival is ...
32.5°	Under 15 minutes	Under 15-45 minutes
32.5° – 40°	15 – 30 minutes	30 – 90 minutes
40° – 50°	30 – 60 minutes	1 – 3 hours
50° – 60°	1 – 2 hours	1 – 6 hours
60° – 70°	2 – 7 hours	1 – 6 hours
70° – 80°	3 – 12 hours	Indefinitely
Over 80°	Indefinitely	

Sudden Disappearance Syndrome. Georgia Better Boating Handbook, 1984. Federal Regulations for Recreational Boats

When a person falls into cold water, life expectancy is greatly reduced. There are ways to increase the chances of survival:

Do not discard clothing – it helps to trap the body's heat.

Do not exercise – thrashing around in cold water only leads to exhaustion and swirling water takes heat from the body more rapidly than still water.

Remember the 50/50 Rule – If water temperature is 50° F or less, you have a 50/50 chance of surviving 50 minutes.

A PFD will help for two reasons: it lessens the need to move around in the water and it helps insulate against heat loss. When wearing a PFD, a person should draw their knees to their chest and wrap their arms around their legs in what is called the self-huddle (or H.E.L.P. – heat-escape lessening posture). If there are several people in the water, huddling together with arms around each other's shoulders is the best survival technique.

Treatment for hypothermia involves getting heat back into the body and raising the inner temperature. A hot shower, wrapping in blankets, hot water bottles, and skin-to-skin contact are excellent ways to transfer heat.

EFFECTS OF LOSS OF BODY TEMPERATURE

<u>Internal Body Temperature</u>	<u>Symptoms</u>
95° F and above	Person is conscious and alert, but may have shivering that becomes uncontrollable as temperature nears 95° F. Respiration increases at first.
90° to 95° F	Person is conscious but disoriented and apathetic. Shivering is present, but diminishes as temperature drops. Below 93° F respiratory rate gradually diminishes and pupils begin to dilate.
86° to 90° F	Person is semi-conscious. Shivering is replaced by muscular rigidity. Pupils are fully Dilated at 86° F.
80° to 86° F	The person is unconscious and respiration is diminished.
80° F and below	Respiration is barely detectable or non-detectable. Death usually follows.

3. NOISE STRESS

Excessive machine noise is often encountered during inspections or operation of equipment. Excessive noise affects the ability to hear by damaging the tiny hair cells in the cochlea of the inner ear. These hair cells change the vibrations of acoustical energy (the “message” of the sound) into nerve impulses that are sent to the brain.

People are born with a fixed number of hair cells (about 40,000) and by the age of 50 most people experience some hearing loss from background noise exposure. Excessive noise causes hair cells to become prematurely broken, bent out of shape, or destroyed.

When the nerve impulse reaches the brain, additional impulses are transmitted to the central nervous and hormonal systems. It is thought that excessive noise causes damage throughout the body by this mechanism.

a. Effects of Noise

Excessive noise affects the ability to hear. Permanent hearing loss may result from long-term exposure to loud noise or from short-term exposure to very loud noise. High-pitched sounds are more damaging to hearing than low-pitched sounds. Normally, the ability to hear high-pitched sounds is attacked first. Other biological effects of excessive noise include:

- Increased pulse rate
- Increased blood pressure
- Narrowing of blood vessels
- Nervousness, sleeplessness, fatigue

b. Preventing Hearing Loss

There is no cure of hearing damage caused by exposure to excessive noise. Prevention is the only way to avoid permanent damage. OSHA regulations (29 CFR 1910.95) limiting worker exposure to noise include:

- Permissible exposure limit of 90 decibels over an 8-hour day
- Lower time limits for higher noise level
- Institution of a hearing conservation program, include tests when workplace exposure exceeds 85 decibels over an 8-hour day.

c. Noise Control Measures

Measures that can be taken to control exposure to excessive noise levels include:

- Limiting time in areas of high noise levels
- Wearing hearing protective devices (ear plugs or ear muffs)
- Controlling the source of noise if possible
- Reducing noise intensity by placing barriers between the source of noise and yourself.

Chapter X

LADDERS

Never climb ladders while carrying a heavy load. Ladders require the use of both hands. Loads not only tie up the hands, but also unbalance the body. Loads should be lifted by winch or pulley.

A. Ladders and Climbing

Climbing can be very hazardous and every employee must use good judgment when climbing is necessary. The employee needs to understand how to inspect equipment for damage and how to safely use the climbing equipment. The remainder of this section will cover the use of ladders for climbing. If ropes and specialized equipment are needed for climbing, the employee should receive formal training prior to attempting to use the equipment.

1. LADDERS

- a. Always choose the ladder that appropriately meets the specifications of the job.
- b. All wood ladder parts shall be free from sharp edges and splinters, sound and free from accepted visual inspection from shake, wane, compression failures, decay, or other irregularities. Metal ladders should not have sharp edges, burrs or other defects.
- c. Ladders shall be maintained in good condition at all times, the joint between the side rails shall be tight, all hardware and fittings securely attached, and the movable part. Metal ladders should not have sharp edges, burrs or other defects.
- d. Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.
- e. Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "DANGEROUS, DO NOT USE".
- f. Rungs should be kept free of grease and oil.
- g. Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder. The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held in position. Ladders shall not be used as platforms, runways, or scaffolds.

- h. Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.
- i. No ladder should be used to gain access to a roof unless the top of the ladder shall extend at least 3 feet above the point of support, at eave, gutter, or roofline.
- j. Tops of stepladders shall not be used as a step.
- k. Only one person shall use a ladder at a time.
- l. When ascending or descending, the climber must face the ladder.
- m. Users are cautioned to take proper safety measures when ladders are used in areas containing electric circuits to prevent short circuits or electrical shock.
- n. Ladder rungs must be evenly spaced in order to prevent a miss step that can result in loss of balance or grip and the possibility of falling. If rungs are not evenly spaced, extra caution must be used.
- o. Store ladders where they are protected from the elements and inaccessible to unauthorized personnel.
- p. Do not cover entrances or exits with ladders or leave them in positions that might be hazardous to people in the area.

2. CLIMBING LADDERS

Persons preparing to climb ladders should wear sturdy well fitted gloves, sturdy boots in good repair, and clothing that is snug enough so that it is not likely to catch on the ladder.

Climbing and descending should be done facing the ladder. The foot should be placed on one rung at a time (never skip rungs) so that the front edge of the heel is against the rung to prevent slipping, particularly on wet, oily or slippery rungs. The hands should firmly grasp the rungs, not the rails. Gripping the rungs for climbing, as fire fighters are trained to do, provides greater control and less chance of slipping than gripping the side rails of a ladder; the climbing rhythm should be followed so that at any time one hand has a firm grip on a rung while the other is reaching for the next rung up or down.

Safe climbing requires both hands to be free for gripping the rungs of the ladder. Nothing should be carried in the hands while climbing. If tools and small equipment cannot be hoisted, they should be carried up ladders only in backpacks, on shoulder straps, or on belts.

Care should be taken to prevent tools or equipment (in backpacks, in pockets, or on tool belts) from catching on a rung or rail and throwing the climber off balance, or from becoming dislodged from the pack and falling to a lower surface.

Portable ladders should be checked for total weight capacity. Never have more than one person climbing the ladder at one time. Check that there are no bows, bends, cracks, or rotted wood in the ladder. Never use a make shift ladder constructed on site. Never use ladders as scaffolding or bridges to cross open areas. Ladders are designed to have part of the weight distributed in downward compression on the rail members. Use of a ladder as a scaffold or bridge may exceed its design strength and should not be used in that manner.

Use only ladders that have cleat, no-slid feet or bottom pads. The single most frequent accident involving portable ladders is the bottom slipping outward away from the vertical support surface. Make sure the bottom of the cleat pads rest on a non-slip level surface. Beware of gravel, grass, smooth wet concrete, or oily slippery surfaces.

Before climbing a portable ladder, position a crewmember at the foot of the ladder to stabilize the bottom while climbing is taking place.

Make sure the ladder is properly positioned on a secure and level surface before climbing. Never attempt to shift or move a ladder while still on it. Remove all equipment hanging from the rungs before shifting position of the ladder. When moving a ladder, position one crewmember on each side to firmly grasp and stabilize it. Position the ladder with the base a safe distance from the vertical surface it is up against. If the base is too close to the vertical surface, there is the danger of the weight of the climber causing the ladder to fall backwards. If the base is too far from the surface there is increased strain on the structural members of the ladder and a tendency for the bottom to slip away from the vertical surface.

3. PITCH OF FIXED LADDERS

Fixed ladders shall be considered as substandard if they are installed within the pitch range of 60 and 75 degrees with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range shall be considered as a critical range to be avoided if possible.

Pitch greater than 90 degrees ladders have a pitch in excess of 90 degrees with the horizontal and are prohibited.

Maintenance – All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.

Chapter XI

LIFTING AND CARRYING

1. Lifting Basics

a. LIFTING PROCEDURES

The following lifting procedures are designed to take the hazard out of lifting heavy objects:

- (1) Make certain that the load can be lifted safely by one person. If load seems heavy, request help before lifting.
- (2) If available, use a mechanical lifting device.
- (3) Inspect the route to be traveled, making sure that there are sufficient clearances and no obstructions or spills (water, oil, ice, etc.) on the floor.
- (4) Inspect the objects to decide how it should be grasped. Make sure handles are fastened securely. Look for sharp edges, slivers or other things that might cause injury.
- (5) Before lifting a case, check to see if equipment stored inside is secure. A sudden shift in weight while the case is being carried may throw the individual off balance and result in a dangerous fall.
- (6) For large, bulky loads, or loads that cannot be comfortably handled due to weight or size, two persons should be employed. As necessary, use hand trucks, block and tackle, and other carrying devices.

b. LIFTING TECHNIQUES

- (1) Keep feet parted – one alongside, one behind the object.
- (2) Keep back straight, nearly vertical, with the spine, back muscles and organs of the body in correct alignment.
- (3) Tuck your chin in.
- (4) Bend knees.
- (5) Assume squatting position.
- (6) Grip the object with your whole hand.
- (7) Tuck elbows and arms in.
- (8) Keep body weight directly over feet.
- (9) Start the lift with a thrust of the rear foot.
- (10) When setting the object down, never twist your body. Stand as close to the unloading point as possible.

Chapter XII

OFFICE SAFETY

Emergency telephone numbers, including emergency rescue, hospital, fire and police, should be posted conspicuously at a telephone in each office.

Appropriate office furniture should be made available for the number of people, the space, and the specific job requirements. Furniture should be placed so as to afford requirements. Furniture should be placed so as to afford optimum egress and ingress. File cabinets, stools, copy machines, etc., will not be placed so as to produce a hazard to traffic flow.

Office equipment may also be an electrical hazard if not properly installed, operated, and/or maintained. Selection of the wrong extension cord, or a damaged or outdated one, can result in electric shock or a fire. Failure to follow maintenance instruction for the equipment to be serviced can result in electric shock, burns, cuts or dismemberment.

Prior to operation, the operator should be trained in the general use of the equipment. Only the operator trained to perform the work should do any repairs or cleaning. The training may be obtained from the equipment manufacturer or supplier or by reading the owner's manual. The following items must be considered when operating office equipment:

1. Electrical office equipment must be off and the cord unplugged, when being cleaned or maintained.
2. Electrical cords should be kept out of traffic areas. Guards should cover cords that must cross walkways.
3. All electrical devices, except clocks, (and laboratory equipment unless otherwise specified) should be turned off when not in use.
4. Copy machines are both a shock and burn hazard to persons not trained in the proper maintenance procedures. The practice of wedging or jamming control buttons is particularly hazardous and is not permitted. The designated operator is to be called in case of any machine malfunction.
5. All coffee makers and space heaters must be turned off prior to closing the office for the day. Also, only approved extension cords should be used with the equipment.

Chapter XIII

PARK GATES

1. All gates will be padlocked whether in an open **OR** closed position.
2. Gates will be inspected at regular intervals to ensure that they are safe and operating satisfactorily.
3. Gates will have signs and/or reflectors attached to ensure they are highly visible.
4. No steel cable gates will be allowed on sites unless properly marked.

Chapter XIV

PLAYGROUND INSPECTION GUIDELINES

Each year in the United States, emergency departments treat more than 200,000 children ages 14 and younger for playground-related injuries (Tinsworth 2001).

About 45% of playground-related injuries are severe—fractures, internal injuries, concussions, dislocations, and amputations (Tinsworth 2001).

Between 1990 and 2000, **147 children** ages 14 and younger **died** from playground-related injuries. Of them, 82 (56%) died from strangulation and 31 (20%) died from falls to the playground surface. (Tinsworth 2001).

There are two standards that are followed to reduce playground injuries:

CPSC handbook for Public Safety Playground Safety that was created by the US Consumer Product Safety Commission in 1997.

ASTM F-1487 a national voluntary standard created by the American Society for Testing and Materials International.

What is your part as a park manager in the playground safety plan?

You are the most critical link in our system. You determine how long children are exposed to hazards on our playgrounds. Your vigilance protects our most vulnerable guests.

Below is a blank and sample monthly report that can be adjusted to fit your park. Complete one monthly for each playground on your park. (ex. day-use, campground, cottage).

A hard copy is to be filed at the park and will be inspected annually as part of the annual playground inspection.

It can be downloaded from <http://www.georgiastateparks.org> under staff resources.

GEORGIA STATE PARKS
MONTHLY PLAYGROUND INSPECTION FORM

12/29/2008

Site: _____

Inspector: _____

Date: _____

Start/Finish Times: _____

Repairer: _____

Date: _____

Start/Finish Times: _____

Use the following codes: 1 = Okay 2 = Needs Maintenance 3 = Request for Repair
O = Supervisor Notified and Work Order Written X = Corrective Action Completed

Inspection Items	Code	Inspection Comments	Repair Comments
Vandalism: damage, graffiti, glass, trash			
Broken equipment (Clamps)			
Loose or Missing Hardware			
Chains: kinked, twisted, broken			
Guardrails / Handrails Secure			
Seats: cut, cracked, missing			
Rusted surfacing, hardware			
Sweep Walkways, Platforms, Steps			
Footers Exposed			
Standing Water			
Objects in Surfacing Material			
Rake / Level Surfacing Material			
Need Surfacing Material For...			
Swings			
Climbers			
Slide			
Sliding Pole			
Other			
Other			
Other Items (please specify)			
Other Items (please specify)			

For Office Use Only:

Reviewed by Maintenance Supervisor: _____

Date: _____

Reviewed by Park Manager: _____

Date: _____

NOTE: This information has been prepared to assist the DNR-PRHS attorney in defending potential litigation. Do not release to any person except a DNR official or an investigating officer. Hard copy to be kept in site files for 7 years.

USE BACK OF FORM FOR ADDITIONAL COMMENTS

REPORT VANDALISM TO THE MANAGER OF PARK OPERATIONS OR YOUR MAINTENANCE SUPERVISOR

GEORGIA STATE PARKS
MONTHLY PLAYGROUND INSPECTION FORM

12/29/2008

Site: Crooked River - Day-use

Inspector: Ronnie McClure

Date: _____ **Start/Finish Times:** 0915 - 0945

Repairer: Ronnie McClure

Date: _____ **Start/Finish Times:** _____

Use the following codes: 1 = Okay 2 = Needs Maintenance 3 = Request for Repair
O = Supervisor Notified and Work Order Written X = Corrective Action Completed

Inspection Items	Code	Inspection Comments	Repair Comments
Vandalism: damage, graffiti, glass, trash	X	Broken glass in sand	Removed
Broken equipment (Clamps)	1		
Loose or Missing Hardware	X	Bolts connecting slide to deck loose	Tightened
Chains: kinked, twisted, broken	1		
Guardrails / Handrails Secure	1		
Seats: cut, cracked, missing	③	Swing seats cracked	Removed /Ordered
Rusted surfacing, fasteners	1		
Sweep Walkways, Platforms, Steps	X	Debris	Blew off
Footers Exposed	X	Exposed	Covered with wood chips
Standing Water	1		
Objects in Surfacing Material	2	See vandalism	Removed
Rake / Level Surfacing Material	X	See footers and slide	
Need Surfacing Material For...			
Swings	1		
Climbers	1		
Slide	X	Low area under slide	Filled in with wood chips
Sliding Pole	1		
X-Wave	1		
Climbing Wall	1		
Other Items (please specify)			
Other Items (please specify)			

For Office Use Only:

Reviewed by Maintenance Supervisor: _____ Date: _____

Reviewed by Park Manager: _____ Date: _____

NOTE: This information has been prepared to assist the DNR-PRHS attorney in defending potential litigation. Do not release to any person except a DNR official or an investigating officer. Hard copy to be kept in site files for 7 years.

USE BACK OF FORM FOR ADDITIONAL COMMENTS

REPORT VANDALISM TO THE MANAGER OF PARK OPERATIONS OR YOUR MAINTENANCE SUPERVISOR

Chapter XV

SITE EMERGENCY TELEPHONE NUMBERS

Manager _____ Office

[Home](#)

Local
Law Enforcement _____ Sheriff/Police

Fire Department

Ambulance _____

Forest Service

Hospital _____

Others

Chapter XVI

STORAGE

1. Materials should be stored on flat surfaces to prevent materials from leaning or falling.
2. Aisles must be wide enough for employees to work with ease.
3. Storage area must be kept clean.
4. All materials stacked should be stacked in an interlocking position and should not be stacked at any heights that will reduce the stability of the stack.
5. When possible stack materials on pallets to prevent water damage.
6. Store corrosive and toxic materials in an area away from the other storage area. Warning signs identifying areas where toxic materials are stored should be posted. Labels should also be applied to containers.
7. Articles of any kind (e.g., poles, life vests, nets, buckets, etc.) should not be stored on boat docks, especially floating docks. Such articles could cause employees to trip and fall resulting in injury.
8. Storage of materials in sheds should allow easy and quick access to all chambers within sheds in case of accident.
9. “Keep Out” or “Employees Only” signs should be in place.

Chapter XVII

SWIMMING POOLS

USE OF LIQUID CHLORINE

1. Chlorine tanks should always be stored indoors in a fire resistant building.
2. Tanks must be chained or strapped to a rigid support to prevent accidental tipping.
3. Tanks and chlorinator must be kept in a separate room with a vent fan capable of complete air exchange in one to four minutes.
4. A gas mask of the type approved for chlorine used by the U.S. Bureau of Mines must be kept just outside the chlorine room at all times.
5. Chlorinator and all tanks should be checked daily for leaks. A small amount of ammonium hydroxide on a piece of cloth will produce white smoke in the presence of chlorine.

GRANULAR OR TABLET CHLORINE (Storage and Handling)

1. Store in a cool, dry place.
2. Keep stored in original container. Do not remove plastic bag.
3. Re-close plastic bag and cover container when not in use.
4. Keep storage area clean.
5. Thoroughly rinse empty container with water.
6. When measuring hypochlorite, use only a china plastic or enamel cup or spoon that is completely dry, clean, and free of any foreign matter, liquid or solid. It is a strong oxidizing agent. Contact with heat, acids, combustibles, organic or oxidizable materials (such as vinegar, paint products, beverages, tobacco, cleaners, soap products, pine oil, kerosene, paper, rags, etc.) may cause fire. In case of fire, douse liberally with water. Avoid contact with eyes. Never mix it with anything except water. Keep out of reach of children.
7. Make sure hands are clean and dry when handling chlorine.
8. Always dispose of hypochlorite by immediately flushing with water.
(Hose down thoroughly or flush down a toilet bowl.)

9. Keep heat, fire, lighted cigarettes and matches away from calcium hypochlorite. Do not store near steam pipes or stoves.
10. Never breathe the fumes or dust from any type of chlorine.
11. **NEVER MIX GRANULAR CHLORINE WITH CHLORINE TABLETS /STICKS. THE CHEMICAL COMBINATION WILL RESULT IN A STRONG EXOTHERMIC REACTION THAT CAN CAUSE SERIOUS INJURY OR DEATH TO THE HANDLER .**

ANTIDOTES:

If a calcium hypochlorite is accidentally taken internally, drink mucilage, raw eggwhite, milk or rice gruel. Follow with emetic (tablespoon of mustard in glass of warm water).

CALL PHYSICIAN

FILTER AND STORAGE FACILITY

1. Filter room should be secured with adequate door locks. When not in use, door should remain locked at all times. Only authorized personnel should be allowed in this area.
2. Danger sign should be posted on outside of entrance to filter room.
3. Storage room for chemicals should have an adequate exhaust fan. This fan should be placed near the floor because of the tendency of chlorine gas to fall, rather than rise.
4. Chemicals should be stored off the floor, if possible. This would help keep them dry. An adequate drain should be placed in room in case of a possible flooding condition.
5. All empty chemical containers should be removed from storage area at once.
6. Storage area should be kept clean and orderly at all times. Contents unnecessary to pool operation should be removed.

SAFETY EQUIPMENT NEEDED

1. Respirator should be worn while applying chemicals.
2. Rubber gloves should be worn to protect hands.
3. Fire extinguishers, properly marked as to location, should be in each storage area.
4. Exhaust fan.

SAFETY PRECAUTIONS

1. Make sure exhaust fan is on and working properly.
2. **NEVER** mix granulated HTH in a pool chlorinator. When granulated HTH is mixed with water inside a chlorinator or an enclosed container, a gummy substance is formed which will stop up the lines. A tremendous amount of gas is formed and a violent explosion will occur. Granular HTH should **ONLY** be applied directly to the pool itself. This application allows any gas to escape into the atmosphere. The application of chlorine is not considered dangerous when applied in this manner.
3. Use only stingy sticks or chlorine tablets in a pool chlorinator.
4. Unless thoroughly trained in the process, no person shall be allowed to chlorinate pools.
5. Keep chlorine in a dry place. Avoid mixing with any other materials – petroleum products especially. When mixed with petroleum products there will be a spontaneous fire and explosion.
6. If possible, never handle chlorine alone. At least two people should work together when chlorinating pool.
7. If you should inhale chlorine fumes, go outside immediately. Breathe fresh air and drink plenty of water.
8. **When servicing chlorinators, as soon as cap(s) are removed, go outside for a few minutes to allow excess chlorine gas to disperse before attempting to refill with chlorine tablets.**
9. **Use only fresh water when mixing granular chlorine. Do not use water obtained from swimming pool, as organic contaminants will interfere with chlorine solubility and may pose a danger.**

DRAINS

1. By December 20, 2008, all pools, whether it has single or multiple drains, needs new anti-entrapment drain covers that must comply with ASME/ANSI A112.19.8 performance standard.
2. On all pools or spas that have single drains that are not unblockable OR two main drains measuring less than 36" apart (three-feet from center to center) per pump must have at least one additional level of entrapment protection. (See 2(a) below)
 - 2(a.) Additional levels of entrapment protection authorized by Virginia Graeme Baker Pool and Spa Safety Act, signed into effect December 2007

- Safety Vacuum Release – a vacuum release system capable of providing vacuum release at a suction outlet caused by a high vacuum occurrence due to a suction outlet flow blockage. (i.e., Stingl Switch, Vac-Alert, Etc.)
- Suction-Limiting Vent System* – a suction limiting vent system that utilizes a collector tank.
- Gravity Drainage* – a gravity drainage system that utilizes a collector tank.
- Automatic Pump Shut Off System – An automatic pump shut off system.
- Drain Disablement- A device or system that disables the drain.

** Suction-Limiting Vent System and Gravity Drainage can only be incorporated in new pool construction and cannot be added to existing pools.

3. Examples of drain covers that are compliant with ASME/ANSI A112.19.8 performance standard can be found at:

<http://www.pooloperationmanagement.com/vgbact.htm>

SKIMMERS

1. Keep skimmer lids fastened securely at all times during pool operation.
2. Only add chlorine sticks or tabs to skimmer basket as a supplement to granular chlorine during periods of heavy use or high ambient temperature
3. Clean skimmer baskets daily. Only add chemicals to skimmer baskets that are free of any type of collected debris
4. Do not add any type of water-balancing chemical, i.e. muriatic acid, cyanuric acid, to skimmers if pipes going to pump are metal construction. Add chemicals to skimmers only when piping is plastic.

WATER BALANCE

1. Chemicals used in achieving correct water balance are dangerous, often corrosive or toxic. Keep Material Safety Data Sheets available on all chemicals you use to treat the pool, no matter how “safe” any certain chemical is assumed to be.
2. Only a Certified Pool and Spa Operator should measure and administer chemicals when trying to achieve proper water balance. The CPO should have an assistant present when at all possible.
3. Add balancing chemicals in small quantities, in order to gradually achieve the proper water balance. Monitor chemical levels very carefully daily in to prevent the need for any large adjustment of pH, alkalinity, calcium hardness, or stabilizer. It is very difficult to adjust the levels in a high volume pool once too high a quantity of any one chemical is added.

4. Routinely monitor the state bathing code to ensure that levels remain in compliance with accepted standards. State of Georgia bathing code can be accessed at <http://health.state.ga.us/pdfs/environmental/pool/poolrules.pdf>

Department of Human Resources Public Health Rules 290-5-57-.17

SPLASH PADS

The splash pad filtering system uses an injection system for chlorine and muriatic acid in order to maintain correct pH in the system.

Use of Muriatic (Hydrochloric) Acid

1. Muriatic Acid should be stored indoors.
2. A gas mask should be used during handling of acid at all times.
3. Always have two people present when working with acid.
4. Never mix muriatic acid with any other chemicals.
5. Always pour in a well-ventilated area.
6. Use safety equipment (gloves and goggles) when handling.

Antidotes

1. If muriatic acid comes into contact with eyes, flush for 30 minutes with warm water and then seek medical attention at nearest hospital.
2. If muriatic acid comes into contact with skin, flush affected area for 30 minutes and then seek medical attention.
3. If gas is inhaled, move victim to fresh air and seek medical attention if symptoms occur.
- 4.

If ingested, DO NOT induce vomiting. Seek medical attention immediately.

Chapter XVIII

VEHICLE SAFETY

A. General Information

Safe driving can be measured in terms of quantity and quality. The quantity of driving is the distance driven. The quality of the driving is more important and is measured in terms of perfect or less than perfect. Perfect driving means that a driver completes each trip without accidents, without traffic violations, without vehicle abuse, without excessive schedule delays and without courtesy. Safe driving also displays a positive image for the driver and the employer.

The purpose of this chapter is not to provide a substitute for experience, but rather to provide some guidance to Departmental employees in areas where they can exercise some positive attention and control while operating a motor vehicle. This chapter will not cover particulars in driver technique but provides general information for the safe operation of a vehicle. For detailed information on driving technique, each employee should refer to the publications listed in the reference section.

B. Operation

The most obvious possible safety precaution for operating a motor vehicle is not to drive at all; however, this is not a reasonable solution. Each person that drives must pass a written and driving exam that includes safety. Since safety is not a new subject to the driver this section will only cover particular items related to the general operation of a vehicle and should serve as a safety reminder.

This section covers items that should be checked prior to operating a vehicle, seat belts, speed limit, refueling, cargo, defensive driving (in general), and four-wheel drive vehicles. For detailed information on the above subjects, each employee is encouraged to obtain and read the publications listed in the reference.

1. CHECK LIST – Prior to operating a motor vehicle, the following items should be checked for your safety, and corrected accordingly:

- (a) Proper inflation of all tires including spare.
- (b) Visual check for excessive tire wear.
- (c) Level of all fluids to include engine oil, engine coolant (do not remove radiator cap if engine or coolant is hot), windshield washer solution and transmission fluid (check at end of trip when transmission fluid is hot).
- (d) Proper angle and adjustment of rear view and side mirror(s).
- (e) Operation of turn signal and braking lights.
- (f) Operation of horn and windshield wipers.

- (g) Clear the floorboard of any obstructions that might impede driving.
 - (h) Clear all windows of dirt, ice, etc., in order to permit adequate vision.
 - (i) Proper operation of engine.
2. SEAT BELTS – The driver and passenger(s) must wear seat belts at all times.
 3. SPEED LIMIT – The driver should operate the vehicle at a safe speed for the road and weather conditions encountered. However, the posted and/or established speed limit must not be exceeded at any time.
 4. REFUELING – When refueling a vehicle, the following precautions must be observed:
 - (a) Do not leave the engine running while the fuel pump is in operation.
 - (b) Do not leave the vehicle unattended while the fuel pump is in operation.
 - (c) Do not smoke in the area of the fuel pumps.
 - (d) After refueling, insure the fuel filler nozzle is positioned in pump and the fuel filler cap is securely fastened.
 5. CARGO – Equipment carried in or on the vehicles should be secured properly so as not to create a hazard for the persons in the vehicles or other vehicles on the road. If equipment is transported in an open area of a vehicle (as in the back of a van) then a cargo cage should be installed to protect the vehicle operator and the passengers. Potentially dangerous equipment such as matches and bush hooks should be carried in a truck box or in the trunk of the vehicle.

Vehicles should not be overloaded, nor should they be loaded in such a manner that obstructs the driver's vision.

6. DEFENSIVE DRIVING – Perfect driving involves the ability to operate a motor vehicle in such a manner as to avoid being involved in a preventable accident. Most accidents are preventable by one or both of the drivers involved, even though this sometimes involves letting the driver in the wrong have the right-of-way.

Defensive driving is a key concept. It represents an approach to the driving task that, when applied, can lessen your chances of being involved in a motor vehicle accident. Defensive driving means driving so as to prevent accidents in spite of the actions of others or the presence of adverse driving conditions.

- (a) STANDARD ACCIDENT PREVENTION FORMULA

(1) **SEE THE HAZARD** – Think about what is going to happen or what might happen as far ahead of encountering a situation as possible.

(2) **UNDERSTAND THE DEFENSE** – There are specific ways to handle specific situations.

(3) **ACT IN TIME** – Once you have seen the hazard and decided on the defense against it, act!

(b) **HOW TO AVOID COLLISION WITH THE VEHICLE AHEAD**

There are four simple steps that will help you avoid being involved in a collision with the car ahead:

(1) **STAY ALERT** – Watch the signs from the driver ahead as to what he or she intends to do.

(2) **STAY AHEAD OF THE SITUATION** – Look beyond the driver ahead to see situations that may force them to act quickly and thereby become a threat to you.

(3) **STAY BACK** – Allow one car length for every ten miles of speed (more in adverse weather or road conditions). The best way to do this is to use the “Two-Second Rule” to ensure correct separation between vehicles. If you stay two seconds behind the car in front, you will have the correct distance no matter what your speed is.

(4) **START STOPPING SOONER** – Slow down and touch your brakes the instant you see a hazard developing that may require you to stop or take evasive action. Failure to do this is known as “delayed braking”, a serious flaw in defensive driving technique. A defensive driver should rarely, if ever, have to make a panic stop.

(c) **KNOW ACCIDENT CONDITIONS** – There are six principle conditions that play some role in accidents. These are light, weather, road, traffic, vehicle and driver. A defensive driver must become an expert on all conditions and how to adjust to them.

(1) **LIGHT CONDITION** – The first requirement of safe driving is to see and be seen. Here are some things you can do to adjust to adverse light conditions.

(a) Turn on lights promptly at the onset of darkness – even in midday if it becomes so dark that visibility is

decreased. Switch headlights to low beam when meeting another vehicle and when following another vehicle within 360 feet.

- (b) Do not look directly into approaching headlights.
- (c) Never wear sunglasses for night driving.
- (d) Always reduce speed at night.
- (e) When there is too much light, such as when driving directly into sun glare, in the early morning or late afternoon, wear sunglasses and use your sun visor.
- (f) Remember that under adverse light conditions others also have difficulty seeing, so make sure that they can see you.

(2) **WEATHER CONDITION** – Bad weather can affect traction, visibility and vehicle control. Rain, snow and ice can make road surfaces slippery. Adverse weather can obscure your vision with rain, snow, fog or rain splatter, as well as steamed-up glass. High winds can make steering difficult and cause vehicles to veer to the wrong side of the road. Below are several defensive actions you can take to adjust to the adverse weather conditions:

- (a) Clean windshield and all windows of accumulated snow or ice if your vehicle has been outside.
- (b) In cold weather be sure your motor is warmed up enough to insure reliable performance. Turn on heater before your start to avoid sudden fogging or glass.
- (c) At the onset of rain, fog, sleet or snow, adjust your speed immediately to the changed conditions.
- (d) Be sure windshield wipers, washers and defroster are in good working condition.
- (e) Turn headlights on low beam in fog, rain, extreme cloudiness or snowstorms, even in daytime.
- (f) If ice or snow accumulates on windows, windshield or lights, stop in a safe place to clear it off.
- (g) The early phase of rain is most dangerous because it raises a soapy-slick film of oil and grease accumulated on the roads. At the onset of rain, slow down.
- (h) Bad weather by itself does not cause accidents. Accidents are caused by drivers who do not take immediate measures to adjust to the special hazards brought about by bad weather.

(3) **ROAD CONDITIONS** – Road conditions refer to the total roadway and the type and condition of the road surface. These can affect your ability to steer, stop and maneuver.

Any trip may involve a number of different road conditions, each requiring adjustment in your driving. Below are ways to cope with adverse road conditions:

- (a) Adjust your speed to road surface conditions.
- (b) On snow or ice you must reduce your speed, not only to avoid skidding but also to make certain your stopping distance will be within your clear sight distance ahead.
- (c) On slippery surfaces, slow down sooner so you can use your brake sparingly, start braking sooner, and use less power in starting and accelerating.
- (d) To avoid locked-wheel skids, pump your brakes when stopping on slippery roads.
- (e) If you skid, steer in the direction of the rear of the vehicle is sliding in.
- (f) Remember that ice forms more quickly on bridges, that shady spots remain icy longer, and that concrete pavement usually ices up faster than warmer blacktop roads.
- (g) Slow down in heavy rain that leaves standing water in order to prevent hydroplaning.

(4) **TRAFFIC CONDITION** – The number of vehicles and pedestrians using the same road at the same time, and to a large extent, how well the road is engineered to accommodate the amount of traffic present, create traffic conditions. Here are ways to adjust to traffic conditions:

- (a) Plan your driving routes to avoid congestion as much as possible and select the best regulated routes.
- (b) Because traffic conflicts can trigger emotional reactions among drivers, the defensive driver seeks to influence others by showing courtesy and consideration to other motorists at all times.

(5) **VEHICLE CONDITION** – You, the Driver, are the only one who knows when something is not working right on the vehicle. Only you can spot possible vehicle defects and either repair them or have them corrected by a qualified mechanic. Below are several points to remember about vehicle condition:

- (a) Worn or poorly adjusted brakes cause trouble when the driver is faced with the necessity for stopping quickly.
- (b) Defective turn signals or brake lights can confuse other drivers about your intentions and cause a collision.

- (c) Worn tires increase the possibility of skidding or hydroplaning. A blowout can throw your vehicle out of control. Good tire care is one of the essentials of a safe vehicle.
- (d) A broken or burned-out headlamp not only cuts down your visibility and makes it difficult for other drivers to judge the position of your car in a lane.
- (e) The interior of your vehicle can contribute to the “second collision” in the event of a crash. Heavy or sharp objects stowed on the rear shelf of your vehicle can become lethal projectiles.

(6) **DRIVER CONDITION** – Driver condition refers to your physical, mental and emotional fitness to drive. Below are several important points to remember about driver condition:

- (a) When you do not feel up to driving, be willing to postpone the trip or have someone else drive.
- (b) The most dangerous physical condition is being under the influence of alcohol. Do not drink alcohol and drive.
- (c) Taking prescription, non-prescription and illegal drugs can affect driving.
- (d) Fatigue and sleepiness are other dangerous driving conditions. When you find yourself dozing at the wheel, do not fight it. Pull off the road for coffee, exercise and fresh air. If necessary, take a nap or let someone else drive.
- (e) Late night driving can be dangerous if one is tired and sleepy. If possible, spend the night in a motel and get a fresh start the following morning.

(7) **FOUR WHEEL DRIVE VEHICLE (4X4)** – A four wheel drive (4 x 4) vehicle handles differently than a two wheel drive vehicle. Prior to operating a 4 x 4, the operator should read the owner’s manual for the vehicle. When the vehicle is in the 4 x 4 mode, it is very important to understand how the vehicle handles. Otherwise, you may roll the vehicle and be injured.

7. **RIDING IN TRUCK BEDS** – If riders need to be transported in the bed of a truck they must be seated on the truck bed with their arms and legs inside the bed. Riding on tool boxes and side rails is not allowed.

C. Safety Equipment

The Georgia Department of Natural Resources, Administrative Policy on Safety (1984) requires certain equipment for vehicles. The policy does not list any equipment for office (in-town use) vehicles. However, all field vehicles should be equipped with the following safety equipment:

1. fire extinguisher (Class B and C rating)*
2. first aid kit*
3. jumper cables and goggles
4. flashlight
5. emergency tire inflator

* required equipment

D. Accidents

See section on Motor Vehicle Accident Report Procedures.

E. Vehicle Maintenance

The safe operation of a motor vehicle is directly related to its maintenance. A poorly maintained vehicle is more likely to develop mechanical problems that may result in loss of control and an accident. A well maintained vehicle allows a driver to concentrate on defensive driving rather than worrying if he or she is going to reach their destination safely.

Motor vehicles must be maintained in a safe operating condition and should be serviced at prescribed intervals. Sometimes problems develop while on a trip and repairs must be made at an out-of-town garage or on the side of the road. The following items may help the driver who develops vehicle problems while on a trip:

1. **MECHANICAL REPAIRS IN THE FIELD** – If your vehicle develops mechanical problems that affect its safe operation (brakes, steering, transmission or accelerator), it should be towed to a local garage. Obtain an estimate for repairs, if possible, and call your supervisor and request approval for the repair.
2. **FLAT TIRE** – Pull off the roadway to the right, park in the emergency lane of the highway or off the pavement and activate emergency flashers. If possible, use the emergency tire inflator and stop at the first available garage and have the tire repaired. If you must change the tire, follow the written instructions outlined in the owner's manual in the glove box of the vehicle.
3. **JUMP START** – Caution must be exercised when jump-starting a vehicle due to the possibility of a hydrogen gas explosion. Below is a procedure for jump-starting a vehicle:

- (a) Make sure the two vehicles are not touching and all electrical equipment and lights are off.
- (b) Make sure both vehicles have parking brakes set and the transmission shift lever is in the park position.
- (c) Put on eye protection (goggles) and do not hold head over batteries at any time.
- (d) After putting on eye protection, fan the battery area with a piece of cardboard or your hand to blow away any hydrogen gas.
- (e) Connect one end of a jumper cable (red color) to the positive terminal (+) of the good battery and the other end (red color) of the positive terminal (+) of the dead battery. Now, connect one end of the second cable (black color) to one end of the second cable (black color) to the negative terminal (-) of the good battery and the other end (black color) to the engine block of the car with the bad battery. The purpose of the last connection is to prevent a spark near the dead battery.
- (f) Once the engine is started, reverse this procedure

GEORGIA DEPARTMENT OF NATURAL RESOURCES

SAFETY MANUAL

PART III

EQUIPMENT

Chapter I

BATTERY CHARGERS

1. Battery charging liberates a mixture of hydrogen and oxygen gases from the battery cells. This mixture can be highly explosive. Be sure to take adequate precautions. Smoking or the use of any flames near the battery is dangerous and prohibited. Prevent sparking by connecting and disconnecting the charger clips only when the charger is disconnected from AC, etc.
2. Loosen, but do not remove, filler caps of battery cells during charge to prevent build-up of gas pressure which could burst cells.
3. Make certain to observe proper polarity. Connect positive (+) clip to positive (+) clip battery post and minus (-) clip to minus (-) battery post.
4. Check to see that the charger voltage selector switch is in proper position for the battery being charged.
5. Battery should be full of water to avoid overheating during charge.
6. Eye protection should be worn at all times.

Chapter II

BUSH HOG – ROTARY CUTTER

1. Exercise extreme caution when operating a bush-hog. The blade peripheral speed is approximately 100 miles per hour.
2. Do not allow anyone near the bush-hog when it is in operation.
3. Before dismounting from the tractor, always lower the cutter to the ground and disengage the P.T.O.
4. Safety shields must be kept in place at all times.
5. Keep hands and feet from under cutter at all times.
6. Use extra caution when operating on rough terrain and in areas where rocks, debris or stumps are present.
7. Transport at safe speeds. Do not transport with PTO engaged.
8. Become familiar with terrain before bush-hogging.
9. When mowing roadsides, always put out “Men Mowing” signs along roadsides to warn traffic that a tractor is in operation.
10. Protective chains will be in place to prevent or reduce items being thrown from under bush-hog.
11. Helmets and goggles or glasses must be worn at all times. Safety sign on back.
12. Only individuals properly qualified/trained to operate equipment may do so.

Chapter III

CHAIN SAWS

1. READ YOUR OWNER'S MANUAL AND ALL SUPPLEMENTS (if any enclosed) thoroughly before operating your saw.
2. Operation of a chainsaw should be restricted to mature, properly instructed individuals. DO NOT ATTEMPT OPERATIONS BEYOND YOUR CAPACITY OR EXPERIENCE. No one may operate a chain saw before being approved by his/her supervisor.
3. WEAR CLOSE-FITTING AND PROTECTIVE CLOTHING including safety hat, goggles, shoes, gloves, ear plugs or sound barriers, and chain saw chaps. Keep your shirt tucked-in and button/zip jackets and sleeves.
4. DO NOT USE ANY OTHER FUEL THAN THAT RECOMMENDED IN YOUR OWNER'S MANUAL.
5. REFUEL IN A SAFE PLACE. OPEN FUEL CAP SLOWLY to release any pressure that may have formed in fuel tank. DO NOT start a saw where you filled it or where fuel has been spilled. DO NOT refuel a hot saw – allow it to cool off. Be certain the saw has dried thoroughly before starting if fuel has been spilled on the unit.
6. NEVER SMOKE while fueling or operating the saw.
7. DO NOT WORK ALONE. Always have a spotter when felling to watch for widow makers and shifts from the intended direction of fell. Position the spotter where he/she can warn you of immediate dangers, but not be in the direction of the fell.
8. START YOUR SAW WITHOUT HELP. DO NOT start a saw on your leg or knee. Always start the saw with it sitting on level ground. With the chain break locked, put your left foot inside the handle and pull straight up on the crank rope. Never operate a chain saw when you are fatigued.
9. KEEP ALL PARTS OF YOUR BODY AND CLOTHING AWAY FROM THE SAW CHAIN when starting or running the engine. Before you start the engine, make sure the saw chain is not contacting anything.
10. DO NOT FELL A TREE during high or changing winds.
11. USE WEDGES TO HELP CONTROL FELLING and prevent binding the bar and chain in the cut.

12. Beware of the kickback. Hold the saw firmly with both hands when engine is running; use a firm grip with thumbs and fingers encircling the chain saw handles and watch carefully what you cut. Kickback (saw jumps or jerks up or backwards) can be caused by:
 - A. STRIKING LIMBS or other objects accidentally with the tip of the saw while the chain is moving.
 - B. STRIKING METAL, cement, or other hard material near the wood, or buried in the wood.
 - C. RUNNING ENGINE SLOWLY at start of, or during cut
 - D. DULL or LOOSE CHAIN
 - E. CUTTING ABOVE SHOULDER HEIGHT
 - F. INATTENTION in holding or guiding saw while cutting.

DO NOT ALLOW a moving chain to come into contact with the ground. This will dull the chain and increase the chance of kickback.

13. BE SURE OF YOUR FOOTING and pre-plan a safe exit or escape route from a falling tree or limbs. Make sure the escape route is free of debris and trip hazards and if necessary, that there is enough room for you and the spotter to safely escape.
14. DO NOT SET A HOT SAW DOWN in areas where flammable material is present.
15. WE STRONGLY RECOMMEND you do not attempt to operate the saw while IN A TREE, ON A LADDER, or ON ANY OTHER UNSTABLE SURFACE. If you elect to do so, be advised that these positions are EXTREMELY DANGEROUS, and you do so at your own risk.
16. DO NOT CUT IN AWKWARD POSITIONS (off-balance, outstretched arms, one-handed, etc.) If using a limbing saw, do not stand directly under the limb that you are cutting.
17. WHEN CUTTING A LIMB THAT IS UNDER TENSION be alert for spring back so that you will not be struck when the tension is released.
18. USE EXTREME CAUTION when cutting small size brush and saplings because slender material may catch the saw chain and be whipped toward you, or pull you off balance.
19. VIBRATION – Avoid prolonged operation of your chain saw and rest periodically, especially if your hands or arms start to have a loss of feeling, swell or become difficult to move. These conditions can reduce your ability to control a saw.
20. EXHAUST FUMES – Do not operate your chain saw in confined or poorly vented areas.

21. OBSERVE ALL LOCAL FIRE PREVENTION REGULATIONS. A fire extinguisher/shovel should be kept close at hand at all times when a chain saw is being used.

NOTE: Spark arrester screens are available for installation in your muffler where fire regulations require them. Check local regulations for your special requirements.

22. Never operate the chain saw without a muffler.
23. DO NOT CARRY THE SAW BY THE CHAIN BRAKE LEVER.
24. TURN OFF your saw when moving between cuts and before setting it down. Always carry the chain saw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
25. DO NOT ALLOW ANY OTHER PERSON or ANIMAL close to a running saw or where a tree is being cut down. Make sure all persons are at a safe distance before beginning the cut. When cutting near roads or trails, have enough staff present to effectively stop all vehicle and pedestrian traffic until the tree has been felled.
26. DO NOT TOUCH or try to stop a moving chain with your hand.
27. DO NOT TOUCH or let your hand come in contact with a hot muffler, spark arrester, or a spark plug wire. DO NOT run the saw without a muffler, exhaust stack, or a spark arrester. Keep screens and baffles clean.
28. KEEP THE CHAIN SHARP AND SNUG on the GUIDE BAR.
29. DO NOT ALLOW DIRT, FUEL OR SAWDUST to build up on the engine or outside of the saw.
30. KEEP ALL SCREWS and FASTENERS TIGHT. Never operate a chain saw that is damaged, improperly adjusted, or is not completely and securely assembled. Be sure that the saw chain stops moving when the throttle control trigger is released. Keep the handles dry, clean and free of oil or fuel mixture.
31. DO NOT OPERATE YOUR CHAIN SAW unless the chain stops when the engine idles. (Have corrected.)
32. All equipment should be inspected before each operation. DO NOT OPERATE the saw if the chain break does not work properly. Before cutting, lock the chain break and accelerate the saw. If the chain moves, have the saw repaired before using.

GENERAL CUTTING INSTRUCTIONS

1. Before using your saw, you should review the safety precautions listed in your owner's manual, and all local regulations for the operation of your saw. These precautions and regulations are for your protection.
2. Test the operation of the CHAIN BRAKE before cutting.
3. Pre-plan a safe exit or escape route from a falling tree or limb (widow maker).
4. For all types of cutting, always hold saw firmly with both hands, with thumbs and fingers encircling saw handles.
5. Cut at high engine speeds (full throttle) only. Do not run the engine slowly at the start or during the cut.
6. Cut wood only.

FELLING (See Diagram)

1. Direction of fall is controlled by the undercut. Type A is easy to make and is commonly used for small trees. Type B leaves butt end of log cut squarely across. Type C is a variation of Type A. The notch should be cut about 1/3 diameter of the tree. On felling cut, do not cut through to notch. Uncut band of wood parallel to notch serves as a hinge. Make cuts in order shown – 1, 2, or 3 on A. (1)
2. When diameter of wood being cut is greater than bar length, make two cuts as shown. (2)

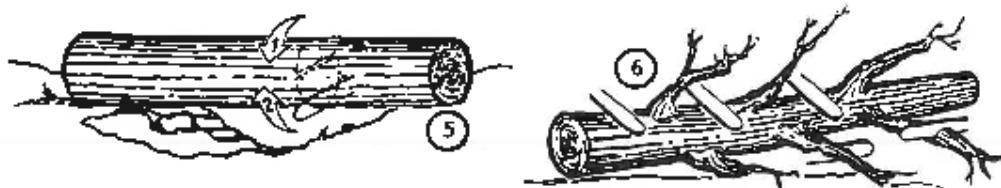
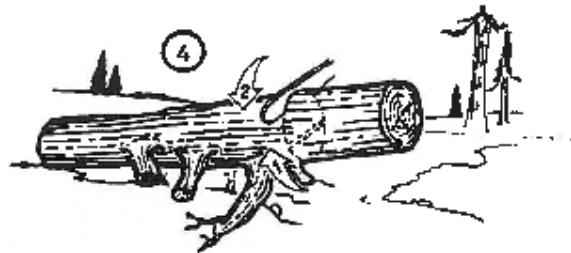
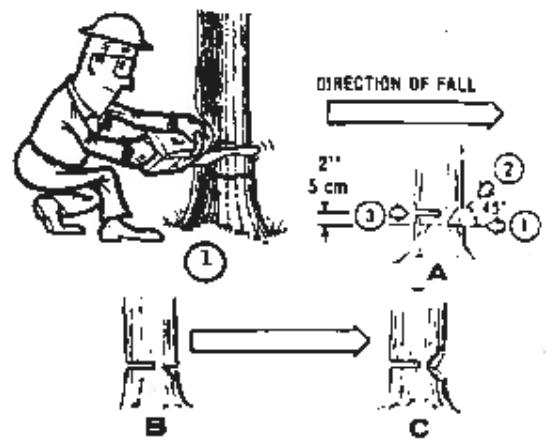
BUCKING (See Diagram)

1. When bucking on a slope, always stand on the uphill side.
2. LOG SUPPORTED ALONG ENTIRE LENGTH: Cut from top (overbuck) being careful to avoid cutting earth. (3)
3. LOG SUPPORTED ON ONE END: First, cut from bottom (underbuck) 1/3 diameter of log to avoid splintering. Second, overbuck to meet first cut and avoid pinching. (4)
4. LOG SUPPORTED ON BOTH ENDS: First, overbuck 1/3 diameter of log to avoid splintering. Second, underbuck to meet first cut and avoid pinching. (5)

LIMBING (See Diagram)

1. Keep the log off the ground. Do not remove supporting limbs until after the log is bucked into lengths. (6)

NOTE: Research shows that chain brakes stop the chain within milliseconds, or more rapidly than the operator can react to consciously control the saw motion when kickback occurs. Reaction time for the average person is 0.75 seconds, but a saw bar can kick upward over 90 degrees in less than 0.3 seconds. According to statistics 77% of chain saw injuries are caused by non-kickback incidents. Research finds that a chain brake can address up to 70% of non-kickback situations as well, because it stops the chain. **DO NOT OPERATE THE SAW IF THE CHAIN BRAKE DOES NOT FUNCTION PROPERLY.**



Chapter IV

CHIPPER AND TRUCK

1. This can be a dangerous piece of equipment so use extreme caution when operating.
2. Each person operating the chipper should read and be familiar with the operator's manual and understands the controls of the chipper and it's safety features.
3. Ensure that emergency stop brake is in proper working condition at all times.
4. Wear proper clothing and protective apparel. Gloves, hard hats, goggles or safety glasses, and ear plugs or sound barriers MUST be worn. Avoid wearing loose fitting glasses and clothing.
5. Release hold on limbs once the feeder assembly engages them and move out of the way after putting limbs in chipper.
6. Feed limbs into the chipper from the side when possible
7. Chips exiting discharge chute are extremely dangerous and travel a considerable distance.
8. **NEVER** operate with visitors around.
9. Allow only one person at a time to feed the chipper.
10. Do not attempt to feed limbs larger than recommended by manufacturer.
11. When moving chipper, make sure discharge chute is in line with the truck to avoid striking obstacles.
12. When dumping chips, watch for overhead lines and do not operate the dump bed on a grade. Doing so could result in vehicle rollover.
13. Always keep hands out from blades when in operation.
14. Always disengage blades when not in use.
15. Be alert for chips and pieces of wood kicking back out of the chipper.
16. No one may operate this machinery before being approved by his/her supervisor.
17. All equipment should be fully inspected before each operation in accordance with operator's manual to ensure mechanical readiness of the equipment.

Chapter V

FRONT END LOADER – BACKHOE

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions to prevent the possibility of injury or damage. The following precautions are suggested to help prevent accidents. Read them carefully before operating your equipment.

1. Read this material carefully to acquaint yourself with the equipment. Working with unfamiliar equipment can lead to accidents.
2. Use the handholds when getting on and off the equipment.
3. For safe operation, observe proper maintenance and repair of all pivot pins, hydraulic cylinders, hoses, snap rings, and main attaching bolts, prior to each day's operation.
4. If the unit is equipped with a roll bar or safety cab, always fasten the seat belt before starting the engine.
5. Keep the operator's platform free of debris.
6. Do not bypass the safety starter switch. Consult your dealer if your safety started controls are malfunctioning.
7. Always be sure of water, gas, sewage, and electrical line locations **BEFORE** you start to dig.
8. Never start the engine while standing beside the unit. Always start the engine while sitting in the operator's seat.
9. Never run the engine in a closed building without adequate ventilation, as the exhaust fumes are very dangerous.
10. No one is allowed to ride on the equipment with the operator.
11. Operate the loader or backhoe controls only when properly seated at the control consoles.
12. Never attempt to lift loads in excess of the loader or backhoe capacity.
13. Never allow anyone to get under the loader or backhoe buckets, or reach through the lift arms when the buckets are raised.

14. Always be watchful of bystanders when operating the loader, when lowering the stabilizers, or when operating the backhoe.
15. Use care when operating on steep grades to maintain proper stability, also drive at speeds compatible with safety, especially when operating over rough ground, crossing ditches, slopes, or when turning.
16. To prevent upsets, avoid full reach and swinging a loaded backhoe bucket to the downhill side when operating on a slope.
17. Watch out for overhead and underground high-voltage electrical lines when operating the backhoe.
18. Exercise caution when operating the loader with a raised loaded bucket or fork.
19. Always carry the loader bucket low for maximum stability and visibility, whether the bucket is loaded or empty.
20. Always use the head-lamps and work lamps for night work.
21. Always lower the loader and backhoe buckets to the ground, shut off the engine and apply the handbrake before getting off the unit. Never get off the unit while it is in motion.
22. Always apply the hand brake and remove the starter key when leaving the unit parked or unattended.
23. Never leave the unit when it is parked on an incline. Always park the unit on level ground where possible. If the unit is to be parked on an incline, always lower the buckets so that the cutting lips contact the ground, apply the hand brake, and securely block the wheels.
24. Always check overhead clearance, especially when transporting the equipment.
25. Always attach the backhoe transport chains before transporting unit.
26. Never attach chains, ropes, cables, etc., to the roll bar for pulling purposes, as the unit can tip rearward.
27. When necessary to tow the unit, do not exceed 5 MPF (8 KPH).
28. When traveling on public roads, use accessory lights and devices for adequate warning to operators of other vehicles.

29. Do not lubricate or make mechanical adjustments while the unit is in motion or when the engine is running. However, if minor engine adjustments must be made, apply the hand brake, securely block the wheels, and use extreme caution.
30. Never make repairs to tighten hydraulic hoses or fittings when the system is under pressure, when the engine is running, or when the loader or backhoe cylinders are under a load.
31. Never refuel the unit while smoking or when the engine is hot or running.
32. Always keep the brakes and power steering system in good operating condition.
33. Do not leave front-end loader bucket or backhoe bucket in an elevated position when not in use or left parked over night.
34. All personnel operating equipment must wear safety helmet, goggles or face shield, or other proper eye protection.
35. Unit should be fully inspected before each operation.
36. No one may operate this machinery without prior approval from supervisor.

Chapter VI

GRINDERS

1. Always use guards and eye shields. Always wear safety glasses or another type of eye protection when operating this tool. Keep the eye shields mounted in their proper position on the wheel guard.
2. Replace a cracked wheel immediately. Handle grinding wheels carefully to avoid bumping or dropping. DO NOT use a grinding wheel that has been dropped. Before using, inspect each grinding wheel for cracks or flaws. If these are evident, discard the wheel.
3. Before mounting a new wheel, be sure that it is marked with an R.P.M. that is the same as, or higher than, the no-load speed of the grinder that is marked on the nameplate.
4. Never start a grinder with anyone, including the operator, standing in line with the wheel. After installing a replacement wheel, stand to one side and allow it to revolve freely for about one minute.
5. Do not grind on the sides of grinding wheels unless they are the special wheels designed specifically for this purpose.
6. Do not over-tighten the wheel nut.
7. Use only flanges furnished with the grinder.
8. **CHECK DAMAGED PARTS!** Before further use of the tool, a guard or other part that is damaged should be carefully checked to assure that it operates properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other condition that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

HELPFUL HINT: A pair of safety glasses attached to grinder when not in use will remind operator to wear eye protection.

Chapter VII

HEAVY EQUIPMENT

The Department has several pieces of heavy equipment that are used to maintain facilities and for new construction. Due to the complexity of operation of the equipment, these statements are in regard to general safety, unless a specific piece is mentioned:

1. NEVER operate a piece of equipment unless properly instructed, and then only after reading the particular equipment's operating manual and safety material. Also, certain items of equipment, such as trucks over a certain weight and truck trailers, require a license.
2. Be certain all items pertaining to vehicle and operator safety are operational. This is to include brakes, gauges, seat belts, relief valves, cages, and all other items pertaining to the particular machine. Vehicle should be inspected before each operation.
3. Be careful operating on slopes; use seat belts if equipped with ROPS or factory cab. Be mindful that track-type machines can slide sideways upon encountering poles or hard surfaces, and wheel-type machines and tracks can "run away" because braking or traction surface is not sufficient to hold vehicle on incline.
4. Always maintain proper following distance. Trucks and heavy equipment cannot stop as quickly as smaller machines, and panic stops can result in "jack-knifing" if pulling a trailer.
5. Be mindful of operating functions that can maim, injure or kill careless operators and/or bystanders. Articulating equipment can be especially dangerous. Never allow anyone in the operating area of articulating equipment. This includes side-to-side motions (backhoes, draglines, booms, excavators, etc.), up and down motions (dozers, loaders, and previously mentioned), and articulated steering machines (skidders, rubber-tired loaders, etc.).
6. Be mindful of overhead obstructions. Wires can cause electrocution, disruption of service, and repair costs. Large limbs, overhead bridges and structures can cause damage, turnover, etc., of equipment and injury to operator. Know height of load, operating capacity, and be aware of hazards. Never touch person and/or machine in contact with electrical wires.
7. Always bind load. Tarp a load that will create a traffic hazard by blowing out of a vehicle uncovered. Check binding regularly during trip to be sure the binding is secure. Be mindful that releasing chain binders can be hazardous. Binder handle can sometimes move rapidly upon release of pressure, stay out of arc of handle. Also, certain loads must be designated "side loads" and certain materials "hazardous", "oversize", etc.

8. Winch operations and pulling objects with a rope, chain, or cable is hazardous if done improperly, or exceeding strength limits of towline. Backlash of breaking towline can maim or kill anyone in its arc. Vehicle and/or object pulled can also be damaged. Backlash can be reduced by attaching a bulky object, such as a jacket or tarp to the towline, if hazardous maneuver must be made and strength limit is met or exceeded.
9. Be aware metal surfaces can be slick when wet. This is to include frost, dew, ice and snow. Stepping areas and dozer tracks can be hazardous to step upon when wet. Also, grease or oil on foot, or damp shoes can result in falls or slipping. Proper footwear should be worn when exposed to these working conditions.
10. Never stand in a compromising position. Be properly suited for directing traffic. Never stand in path of collision, and be aware of hook-up items such as trailers, cables under tension, etc.
11. Keep equipment properly maintained and operational. Cease operations if a malfunction occurs that will endanger operator, bystanders, or machine.
12. Keep first aid kit and fire extinguisher on job site and/or vehicle and know how to use them.
13. Wear proper attire, according to job requirements. This may include hard hats, respirators, steel-toed footwear, coveralls, etc.
14. Keep unauthorized persons out of job area. Keep any visitors out of harm's way. Keep new laborers reminded of hazards. Never allow anyone who is not familiar with and not properly instructed in the use of the equipment to use the equipment. Never allow passengers on equipment not designed to haul passengers.
15. Keep job area and equipment clean and uncluttered. This may permit an unobstructed exit in an emergency.

Chapter VIII

MECHANICAL EQUIPMENT

Mechanical equipment is used in the laboratory and field. However, many employees are not thoroughly familiar with equipment operation. Failure to operate equipment properly could result in electric shock, burns, cuts, dismemberment or death. The following safety rules should minimize accidents from the use of mechanical devices.

1. HAND TOOLS AND POWER TOOLS

- a. All tools should be kept in good repair and used only for the purpose intended. Keep tools sharp and clean for best and sharpest performance. Follow instructions for lubricating.
- b. All tools having defects that impair strength or render them unsafe shall be removed from service.
- c. The operator of power tools shall read the owner's manual and all operating instructions and be familiar with rating and capacities of the tool. Know the tools' potential hazards. Do not operate tools you are not trained to use.
- d. Grinding tools must never be operated by other than qualified personnel equipped with goggles or face shields and utilizing proper equipment guards.
- e. Power saws shall be equipped with guards that automatically and completely enclose the cutting edge. Saws shall never be left running unattended.
- f. Ground all tools. If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter wire must be attached to a known ground. Never remove the third prong.
- g. Remove adjusting keys and wrenches. Form a habit of checking to see that keys and adjusting wrenches are removed before turning on a tool.
- h. Keep work area clean. Cluttered areas and benches invite accidents. After use of any tool, it should be cleaned, stored away properly and the work area should be cleaned, also.
- i. Avoid dangerous environment. Do not expose power tools to rain, and do not use power tools in damp or wet locations to prevent electrocutions. Work area should be well illuminated.

- j. Do not force tool. It will do the job better and be safer at the rate for which it was designed.
- k. Use right tool. Do not force tool or attachment to do a job it was not designed to do.
- l. Wear proper apparel. Do not wear loose clothing or jewelry; it could get caught in moving parts. Rubber-soled footwear is recommended for best footing.
- m. Never stand on tool. Serious injury could occur if the tool is tipped or if cutting tool is accidentally contacted.
- n. Do not overreach. Keep your proper footing and balance at all times.
- o. Disconnect tools before servicing or when changing accessories (blades, bits, cutters).
- p. Use recommended accessories. Consult owner's manual. Use of improper accessories may be hazardous.
- q. Avoid accidental starting. Switch should be off before plugging in cord.

2. MACHINERY AND MECHANIZED EQUIPMENT

- a. No mechanical equipment shall be used without the approval of the individual responsible for the specific item, and without clear instructions being provided to the user.
- b. Inspections and tests shall be made at scheduled intervals on all machinery and mechanized equipment.
- c. Equipment found to be unsafe shall be taken out of service and its use prohibited until the condition has been corrected.
- d. Equipment shall be operated only by designated personnel.
- e. Equipment shall not be operated in a manner that will endanger persons or property nor shall safe speeds or loads be exceeded. Keep children and visitors away. Remove starter keys and turn off master switches. Padlock equipment or work area when not in use.

Chapter IX

OXY-FUEL WELDING AND CUTTING

THE WORK AREA

1. The work area must have a fireproof floor. Concrete floors are recommended. Wooden floors may be used, but only if covered with sand or wetted down with water.
2. Heat-resistant shields or other approved materials should be used to protect nearby walls or unprotected flooring from sparks and hot metal.
3. Adequate ventilation is required to prevent the concentration of oxygen and toxic fumes. It is important to remember that oxygen will serve to accelerate combustion, and cause materials to burn with great intensity. Oil and grease in the presence of oxygen can ignite and burn violently.
4. Workbenches or tables to be used during oxy-fuel processes must have fireproof tops. Firebricks are commonly used for topping these surfaces and supporting the work.
5. Oxygen and fuel gas cylinders should be chained or otherwise be secured to the wall, bench, post cylinder cart, etc., to protect them from falling and to hold them in an upright position.
6. A "No Visitors Allowed" or "Personnel Only" sign should be placed in the area.

PROTECTIVE APPAREL

1. The operator should protect himself from sparks, flying slag, and flame brilliance at all times. Select goggles with tempered lenses shaded five or darker to protect eyes from injury and to provide good visibility of the work. Eye protection should be worn at all times when equipment is in use.
2. Protective gloves, sleeves, aprons and shoes should be worn to protect skin and clothing from sparks and slag. Keep all clothing and protective apparel absolutely free of oil and grease.
3. Remove butane lighters from pockets; a spark or hot piece of metal can cause the lighter to explode with a force equivalent to three sticks of dynamite.

FIRE PREVENTION

1. Never use oil or grease on or around any oxy-fuel apparatus. Even a trace of oil or grease can ignite and burn violently in the presence of oxygen.
2. Keep flames and sparks away from cylinders and hoses.

3. Flying sparks can travel as much as 35 feet, so move combustibles a safe distance away from areas where oxy-fuel operations are to be performed.
4. Use approved heat-resistant shields to protect nearby walls, floors and ceilings.
5. A fire extinguisher must be kept in the work area and checked regularly to ensure it is in proper working order.
6. Use oxy-fuel equipment only with the gases for which it is intended.
7. Never open an acetylene cylinder valve more than $\frac{1}{4}$ turn. Keep the cylinder wrench, if one is required, on the cylinder valve so the cylinder may be turned off quickly if necessary.
8. Never test for gas leaks with a flame.
9. When work has been completed inspect the area for possible fires or smoldering material.

GAS CYLINDER SAFETY

1. Cylinders should be stored on end on a smooth surface.
2. All cylinders should be chained or otherwise fastened firmly to a wall, post or other solid object.
3. Empty cylinders should be stored apart from full cylinders.
4. Cylinders should be located so as to minimize exposure to excessive temperature rise, physical damage, or tampering.
5. Never store cylinders of flammable gases near flammable combustible substances.
6. Before cylinders are removed, check to make sure valves are closed.
7. Always close the valve on empty cylinders.
8. Handle all cylinders with care – a cylinder marked “empty” just might not be.
9. Do not allow empty cylinders to remain on premises. Make sure that they are picked up as soon as they become empty or as soon as you can reasonably get them removed. Always handle the acetylene with extreme care. Acetylene is very unstable and if dropped an explosion could occur.

Chapter X

POWER BLOWERS

1. Always make certain switch is off when not in use.
2. Handle gasoline with care. It is highly flammable.
 - A. Refuel before starting work
 - B. Do not smoke while handling fuel
 - C. Do not refuel a hot engine
 - D. Avoid spilling fuel or oil. Always wipe unit dry.
 - E. Move at least ten feet away from the fueling point before starting engine.
 - F. Always store gasoline in an approved container.
3. Do not operate in an unventilated area.
4. Never allow bystanders in the work area.
5. Do not point the blower in the direction of people.
6. Always wear safety glasses and hearing protection.
7. Avoid wearing loose clothing or loose scarves.
8. Always use a face filter mask to avoid breathing dust.
9. Do not block blower pipe in order to avoid engine damage due to over-revolution.
10. Equipment should be inspected before each operation.

Chapter XI

RIDING MOWERS AND PUSH MOWERS

1. Always keep in mind safety first for yourself, other personnel, and visitors.
2. Know the controls. Read the owner's manual. Know how to stop the engine quickly in an emergency.
3. Make sure the lawn is clear of sticks, stones, wire and debris.
4. Always check engine oil before operating.
5. Avoid mowing in areas where people are present. Because of flying debris mowing around parking lots with parked vehicles should be avoided.
6. Start engine carefully – keep feet well away from the blades when starting and running.
7. Do not operate engine where carbon monoxide fumes can collect.
8. Stop the engine whenever you leave the mower, even for a moment.
9. Always properly maintain the mower, frequently checking all fasteners, guards and parts. Follow manufacturer's maintenance and storage instructions.
10. Do not allow workers to operate mower without instructions.
11. On slopes or wet grass, be careful of your footing.
12. Stop the engine and disconnect the spark plug wire before checking or working on the mower.
13. Never leave a starter in cocked position. This refers to starters using a heavy spring that is crank wound and then released for starting.
14. Do not speed the engine or alter governor setting.
15. Keep all shields and safety devices in place, as instructed in the owner's manual.
16. Do not cut at night or times of low visibility.
17. Keep hands and feet out from under blade. Keep clear of the discharge opening at all times.

18. Stop the blade(s) when crossing gravel drives, walks or roads or driving between areas to be mowed.
19. Always wear substantial footwear. All personnel operating mowing equipment will wear eye and ear protection.
20. Do not smoke while fueling the engine. Never add fuel to a running engine. Use an approved safety container for filling mowers and for storing fuel.
21. Do not remove or disable 'kill switches'.
22. Never dismount a mower with the blades running.
23. Always mow with discharge chutes in place.

Chapter XII

SPRAY PAINTERS

1. Carefully read and understand owner's manual before using spray gun.
2. Never smoke while spraying.
3. Never spray near open flames or pilot lights in stoves or heaters.
4. Ample ventilation should be provided when spraying indoors.
5. Wear a facemask, particularly when spraying indoors.
6. Wear safety goggles or some type of eye protection when spraying.
7. When using a paint tank, always shut off air pressure at source and bleed off all pressure in paint tank by gently pulling safety valve ring before loosening wing nuts to remove lids.
8. Before using a paint tank, the equipment should be inspected to ensure all parts including gauge and regulation are correctly functioning. Also check that no paint or other deposit is in safety valve inlet. In the event more than 60 PSI was applied to the tank and the safety valve was clogged, the higher pressure could burst the tank.
9. Paint should be strained with proper mesh before use.
10. When using airless sprayers, keep fingers and flesh away from front of nozzle. Contact with nozzle will result in a major cut, plus contamination by paint materials. (Some paints contain lead and other hazardous ingredients.)

Chapter XIII

STUMP GRINDER

1. Carefully read and fully understand all operating instructions before attempting to operate the machine.
2. Keep the unit in good operating condition and keep safety devices in their proper places.
3. Wear safety equipment that is required while operating or repairing the unit at all times.
4. Be sure to read all warning and instruction labels placed on the unit.
5. Only individuals familiar with the operation of the equipment may use it.
6. Know how to stop the unit before starting it.
7. The operator must always be at the controls while the engine is running.
8. Spectators/visitors are never allowed in area where unit is in operation.
9. Never operate the unit unless all guards and shields are in their proper place and secured.
10. Disengage power to cutter wheel, stop engine, and remove ignition key before ceasing operation.
11. Always shut off the engine and remove key when making adjustments or repairs.
12. Do not refuel the unit when the engine is running.
13. Release all pressure from the hydraulic system before starting repair or maintenance work.
14. Check and tighten any loose bolts or connections before operating and check periodically during operation.
15. It is important to remember that loose clothing worn by the operator can be extremely dangerous if caught in a moving part.
16. Operators should always wear eye and hearing protection while operating the unit.

17. Be sure to drop all safety curtains on the unit before grinding the stump.
18. Never tow unit unless safety pins are in place if so equipped.
19. Be sure the wheels are locked securely in transport position with the safety pins in place when transporting if so equipped.
20. When transporting the unit make sure that the cutter wheel is raised to transport position and the locking mechanism is in place.
21. Observe caution when transporting over rough roads and sharp turns to eliminate the possibility of the cutter wheel scraping the road and the unit tipping.
22. When transporting, make sure the safety chain on the tongue is hooked to the towing unit.
23. Always drive at a safe transport speed when unit is in tow.
24. When sharpening standard teeth, the operator must wear goggles or a face shield.
25. Make sure all cutting teeth are at the proper angle and are set according to manual.
26. Follow lubricating instructions according to manual.
27. When operating the unit always have a second person close by.
28. For faster results, cut the stump as low as possible with the chain saw. This will save a lot of grinding time.
29. Never grind or transport over a steep incline.
30. Service dry type air filter daily.
31. Follow engine maintenance schedule instructions according to Engine Manual.
32. Do not reverse battery connection. This is for a negative ground system only.
33. Idle the Engine for five minutes before shutting off not doing so could cause scoring of the cylinder walls or valves to be warped.
34. All equipment should be fully inspected before each operation.

Chapter XIV

TRACTORS

1. Use the handholds and step plates when getting on and off the tractor.
2. Always use the seat belt when the roll bar is installed. Never use the seat belt if the roll bar is removed from the tractor.
3. Never start the engine while standing beside the tractor. Always sit in the tractor seat while starting the engine.
4. No one is permitted to ride on tractor with the operator.
5. Always shut off the engine and apply the parking brake before getting off the tractor.
6. Never engage the parking brake when the tractor is moving.
7. The operator should never get off the tractor while it is in motion.
8. Use care when operating on steep grades to maintain proper stability.
9. Always drive the tractor at speeds compatible with safety, especially when operating over rough round, crossing ditches, slopes, or when turning.
10. Keep the tractor in gear when going downhill.
11. When operating P.T.O. – driven equipment, always disengage P.T.O. and shut off the engine before getting off the tractor or disconnecting the equipment.
12. When operating P.T.O. equipment, always apply the parking brake and block the rear wheels both in front and back (stationary equipment).
13. Always keep the tractor brakes in good operating condition.
14. Never run the tractor engine in a closed building without adequate ventilation, as the exhaust fumes are very dangerous.
15. Never install or remove a belt while the belt pulley is in motion.
16. Never clean or adjust P.T.O. – driven equipment with P.T.O. engaged.
17. Never wear loose clothing when operating the P.T.O. or around equipment that is rotating.

18. Always use the drawbar for pull-type work. Never pull from the upper link or rear axle as the tractor can tip backward.
19. Never leave equipment in raised position.
20. If the tractor is stuck, back out to prevent an upset. If logs are used, always put them behind the rear wheels and back out.
21. If the front end tends to rise, install front end of front wheel weights. Do not continue to operate with a “light” front end.
22. Use the flasher warning lamp and headlights when traveling on public roads, day and night.
23. Use proper hand signals when making a turn.
24. Stabilizers should be installed when using the hydraulic lift linkage.
25. Do not refuel the tractor when the engine is overheating or running.
26. Operator shall wear safety helmet and eye protection.
27. Tractor should be inspected before each operation.
28. No one is permitted to operate a tractor without the prior approval of his/her supervisor.
29. Only individuals properly qualified/trained to operate tractors may do so.

Chapter XV

TRAILERS

1. Before trailers are connected to trucks:
 - (a) Tires should be checked for proper inflation
 - (b) Tail gates should be checked for sturdiness.
2. Bail and socket type trailers should be attached only to vehicles with the proper size ball attachment – 1 ½” and 2” being common size.
3. Make sure socket fits properly on ball to form a secure but not binding connection.
4. After trailer is attached, make sure the brakes and the lights to the trailer are plugged into the adapter on the vehicle that is going to be pulling the trailer.
5. Make sure safety chains (which all trailers should be equipped with) are attached to the vehicle in their proper place. If trailer does not have safety chains, trailer is not to be used – inform supervisor.
6. Before pulling the trailer, make sure the turn signals and the brake lights are working properly.
7. Before pulling the trailer, be familiar with certain features of the particular trailer – such as the height and width.
8. Before pulling a trailer in traffic, be familiar with the handling of the trailer – such as the turning radius required, braking early, and backing of the trailer.
9. When loading trailers, the bulk of the weight should be placed to ride directly over the axles. Proper weight adjustment provides for a smoother ride and reduces the chance of an unbalanced trailer.
10. All loads that can possibly shift weight (such as mowers and furniture) should be secured in position.

Chapter XVI

TREE SPADE

1. Know the hydraulic controls. Read the owner's manual. Know how to stop the engine quickly in an emergency.
2. Never add fuel to a running engine. Use an approved safety container.
3. Stop the engine whenever you leave the equipment.
4. Always properly maintain the spade. Frequently inspect all fasteners, guards and parts.
5. Follow manufacturer's maintenance and storage instructions.
6. Do not allow workers to operate spade without instruction.
7. On slopes, be extra careful because machine will tip over.
8. All personnel operating the tree spade shall wear eye protection and work clothing to include work shoes and/or boots. Hard hats are required when machine is in operation.
9. Do not smoke while fueling the engine.
10. Be careful when moving or using equipment and note overhead electrical, phone and TV power lines that could be caught in equipment.
11. Do not operate in area where equipment could come in contact with underground services such as sewage pipes, water lines, electric lines.
12. Always have at least two workers on site while equipment is in use.
13. Do not attempt to dig up uneven sided trees.
14. Do not attempt to repair tree spade while unit is in operation.
15. A $\frac{3}{4}$ ton truck or larger with heavy duty hitch, preferably with electric trailer brake hookup, should be used to transport spade. All safety lights should be working and operational while equipment is moved from one site to another.
16. No one will be allowed to ride on spade.
17. Before moving spade from one location to another all stabilizers must be in upright position.

Chapter XVII

WEEDEATERS

1. Do not mix fuel in a confined area. Conventional fire precautions should be followed when mixing fuels.
2. Do not run or operate engine in a closed room. Fumes from exhaust contain carbon monoxide.
3. Do not smoke while refueling or operation machine.
4. Do not attempt to fill fuel tank and make adjustments while engine is running.
5. Before starting weed-eater, always survey the surrounding area for dangerous obstacles, which might cause trouble.
6. When two or more people are working together, always keep well away from each other to avoid accidents.
7. Never carry a running unit without the shoulder strap in place. The shoulder strap prevents the operator from coming in contact with the blade.
8. Machine should be inspected before each operation to ensure blades are sharp, screws are tight, and all other mechanical parts are functioning properly.
9. Dress properly for the type of work being done. Leather work shoes or short boots should adequately protect the ankles and shins from small sticks, splinters, and other debris. Ear protection and pair of goggles should always be worn for eye protection of the user.
10. When using the blade, do not operate without guard plate. Guard plate should always be working properly when equipment is in use. The cutter blade should be detached or fully covered during transportation.
11. Do not use weed-eater if muffler is defective or missing.
12. In cutting a shrub under tension, be alert for spring back so that you are not whipped when tension is released.
13. Watch out for kickback motion of the blade caused when hitting a hard article on the ground.
14. Do not allow any other people or animals to be near the area where you are using the weed-eater.

15. Before starting the engine, move the weed-eater 10 feet away from the fueling spot.
16. Always keep footing secure and balanced when cutting. Keep a firm grip on the rod and handle at all times.

CHAPTER XVIII

SUMMARY OF SIGNIFICANT SAFETY REQUIREMENTS

This safety program is intended to help produce a more healthful and safer work place for our employees and visitors to our facilities.

GASOLINE REFUELING STATION – The gasoline pump location will be plainly marked with safety precautions so as to prevent fire and/or explosion of flammable fuel. No smoking within 50 feet of the pump. All engines will be shut off prior to refueling. Fuel will be pumped into approved containers only. All personnel are to conform to these safety rules regarding the pumping and handling of gasoline and other flammable fuels and liquids.

WET CELL STORAGE BATTERIES – The storage area for wet cell batteries will be plainly marked with safety precautions including the wearing of eye and skin protection when handling storage batteries. This specifically includes recharging batteries, jump-starting vehicles and boats from one battery to another since batteries are subject to explosions due to sparks in the vicinity of the battery causing eye and skin injury. When filling a battery with acid, special precautions will be taken to avoid contact with the acid. Protection gloves and goggles will be provided at this workstation.

HANDLING OF HAZARDOUS CHEMICALS – Before mixing, spraying, or otherwise handling chemicals that are, or reasonable should be considered toxic or hazardous, all personnel are directed to use such safety items as glasses or goggles, rubber gloves, respirators and any other such items to insure the safe handling and distribution of hazardous or toxic chemicals. All personnel are also notified to store such chemicals in safe containers and in secure locations so as not to pose a threat to humans or animals. This specifically includes such chemicals as insecticides, herbicides, and rotenone. Hazardous spills of toxic chemicals should be reported to EPD as soon as possible and assistance should be given as EPD directs.

USE OF POWER TOOLS – The use of hand-operated power tools such as gasoline-operated chain saws, circular saws, drills, sanders, grinders and any other such tools will be done so after safety goggles and hearing protectors have been put on by the operator. Safety goggles and hearing protectors will be provided in the shop area and operators will ensure that such items are used in field use situations. Safety precaution signs will be posted in the shop area as reminders of these rules.

USE OF POWER MOWERS, TRIMMERS, EDGERS, ETC. – Hearing and eye protection will be used when operating such equipment that may cause foreign particles to get into eyes, and where loud noises are produced which may cause permanent and irreversible hearing loss.

FIRING RANGES AND DISCHARGING FIREARMS GENERALLY – All personnel will ensure that all firearms under their control are handled in a safe and responsible manner at all times. No one under any circumstance or situation will point a gun at anyone or anything they do not intend to shoot except in the performance of their official duty and only as sound judgment dictates. This includes the use of so-called unloaded guns in an instructional atmosphere. Hearing protection will be used by all personnel when discharging their firearms in a range situation or when engaged in firearms practice firing. Loud or prolonged noises can cause permanent hearing loss and it is the responsibility of all personnel to ensure that hearing protection is used under these circumstances.

SNAKES, ALLIGATORS AND DANGEROUS WILD ANIMAL HANDLING – Due to the many possible situations that may be encountered when handling or coming in contact with dangerous animals and reptiles, it would be difficult to cover all possible health and/or safety hazards. Therefore, all personnel are directed to use extreme caution when handling or coming into contact with wild animals under any circumstance or situation. It is, however, recommended that personnel use snake leggings or chaps when handling poisonous snakes or when working in an area such as creeks, ponds, rivers, swamps and other areas where poisonous reptiles are likely to be encountered. Alligators have to be handled from time to time in the course of our duties and extra precautions should be taken to ensure that no injury results. In all such situations, common sense should be used.

WASP, HORNET, BEE STING PREVENTION – Wasp nests and other such bee or hornet nests should be destroyed in the spring and early summer before they have an opportunity to expand. Special wasp and hornet sprays will be kept and used at the office facility to prevent the possibility of stings in and around facility buildings. Since wasps and hornets may be encountered in the wild, it is recommended that any employee that has an acute allergic reaction to wasp stings identify this to his supervisors and fellow workers. If a sting should occur, the allergic employee should be taken to a doctor or hospital as soon as possible for treatment.

LIFTING HEAVY OBJECTS – Back injuries often result from the improper method of lifting heavy objects. It is recommended that when lifting anything of a heavy nature that you use your legs to do the lifting and not your back. Keep your feet at about shoulder width and keep your back straight using your legs to do the actual lifting. Under no circumstances should you try to lift more than you are capable of lifting. Enlist the help of another person or use a mechanical method of lifting.

VEHICLE AND BOAT OPERATION – It shall be the responsibility of all personnel to operate their vehicle and/or boat in a safe and responsible manner at all times. It shall be the duty of each driver to ensure that his or her vessel or vehicle is in good safe working condition and that no safety or health hazards exist. If mechanical defects occur which will or may cause health or safety hazards, report them at once to your supervisor. Seat belts and/or shoulder harnesses should be worn by the driver and passenger of all official vehicles.

Personnel flotation devices and their use are dictated by Department policy, but it is recommended that they be used at all times when operating a boat or vessel. Fire extinguishers should be mounted and maintained in all boats and vehicles. It is also recommended that all boats be equipped with an anchor to prevent uncontrolled drift in case of engine failure.

When training new personnel in boat operation, it is recommended that the trainee be put in calm waters where no obstacles would hinder him or her and be thoroughly briefed on all safety precautions before actual operation. All possible precautions should be taken by the trainer in such situations. State law, Department policy, and common sense should dictate responsible handling and operation of vehicles and boats.

When towing a trailer by vehicle, each operator is to ensure that all safety chains and devices are in good working condition and securely fastened. When towing boat trailers, hunter safety trailers, equipment trailers or other similar equipment, the operator of the vehicle is to operate his or her vehicle in such a manner as to ensure that the safety of himself and the motoring public is not endangered due to carelessness or mechanical failure. Damaged or faulty equipment should be repaired as soon as possible.

BUILDING OBSTACLES – All walkways, driveways, entrances, stairways and steps are to be clearly marked and uncluttered so as to avoid any possible hazard to visitors to the facility grounds and buildings. All step up and step down and overhead obstacles are to be clearly marked. All areas where visitors are not intended to go will be marked AUTHORIZED PERSONNEL ONLY. It shall be the responsibility of each of us to ensure the safety and welfare of visitors to our facilities at all times. Any safety hazards should be reported at once and corrected as soon as possible.

ELECTRICAL OUTLETS AND WIRING – All care should be taken when working with electricity. Any faulty wires, extension cords, lighting fixtures, switches or receptacles should be avoided and repaired at once. Never stand in water or work around water with electrical appliances or tools. Use only properly grounded tools and appliances as an electrical shock may result. Care should be exercised when in the vicinity of electric wires and lines. Under no circumstances should antennae, metal ladders, and other such items be used around high-tension electrical wires or poles.

FIRE EXTINGUISHERS GENERALLY – Fire extinguishers of the appropriate size and type will be placed at locations around facilities wherever there exists the possibility of fire or flame.

NEVER leave tools lying around in public use area. When finished put tools in proper place of storage as soon as possible.

NEVER leave keys in an unattended vehicle.

STORE paint in a non-combustible atmosphere.

BE AWARE of unsafe weather conditions and react accordingly.

KEEP ALL CHEMICALS, PAINT AND POISONOUS MATERIALS locked at all times. Paints, mineral spirits, flammable cleaners, various resins, etc., should be stored in original containers with adequate warnings on container or label. Partial containers are very dangerous and should be disposed of. Carefully plan purchase of flammable so that they can be completely used eliminating the need for storage of partial containers. Do not dispose of partial containers of flammable in the dumpster.

WHEN HAULING MATERIALS on highways always secure with chains, put on tarp or whatever is necessary to secure what you are hauling.

DO NOT SMOKE around gas tanks or other flammable liquids.

TAKE OFF ALL RINGS while welding.

SAFETY HELMETS should be worn during boat salvage operations, at construction locations, and any other time that common sense dictates.

ALL FLAMMABLES being stored (paints, gas, solvents, etc.) should be stored away from fire hazards – welding stoves, etc. If possible, flammables should be housed in separate locations and must be in approved containers.

HIGH VISIBILITY SAFETY APPAREL All workers within the right-of-way of a Federal-aid highway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel. Firefighters or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials may wear reflective turn-out gear that is specified and regulated by other organizations, such as the National Fire Protection Association. Firefighters or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in any other types of operations shall wear high-visibility safety apparel. (Title 23 - - Highways, Chapter I -- Federal Highway Administration, Department of Transportation, Subchapter G -- Engineering And Traffic Operations, Part 634 -- Worker Visibility)

NOTE: All possibility of hazards to health and safety has not been listed here. Therefore it is recognized that each employee will be constantly aware of possible injuries to health and life and will also use good judgment while carrying out his work-related duties. Safety is everyone's responsibility, and you are urged to be alert to all possible safety hazards and dangers.