CHAPTER 2 — SAFETY AND HAZARDS

TABLE OF CONTENTS

Paragraph Number	Title	Chapter/Section Number	Page Number
2-1	General Information	2-00-00	3
2-2	Electrical Safety and Hazards	2-00-00	3
2-3	Standard Practices — General	2-00-00	3
2-4	Standard Practices — Electrical Maintenance or Repairs	2-00-00	3
2-5	Standard Practices — Electrical Work in Confined Spaces	2-00-00	5
2-6	Environmental Safety	2-00-00	5

SAFETY AND HAZARDS

2-1. GENERAL INFORMATION

High voltages in electrical and electronic systems are hazardous to personnel. Serious injury may be caused by electrical shocks or, in some cases, by rapid withdrawal from the electrical source in a confined area. Explosion may occur if sparks are generated in the presence of flammable vapors. Equipment may be damaged if metallic objects contact powered electrical conductors or components.

2-2. ELECTRICAL SAFETY AND HAZARDS

WARNING

OBEY ALL THE SAFETY PRECAUTIONS WHEN YOU DO MAINTENANCE ON OR NEAR ELECTRICAL/ELECTRONIC EQUIPMENT.

High voltages in the electrical and electronic systems are hazardous to personnel. Electrical shocks may cause serious injuries. The generation of sparks in the presence of flammable vapors may cause explosions. Metallic objects that come in contact with the powered electrical conductors or components can cause injury to personnel and damage to components.

2-3. STANDARD PRACTICES — GENERAL

WARNING

OBEY ALL THE SAFETY PRECAUTIONS WHEN YOU DO MAINTENANCE ON OR NEAR ELECTRICAL/ELECTRONIC EQUIPMENT.

When you do any maintenance or repairs to an electrical system, or to any system that requires electrical power, follow these precautions:

- Personnel must be trained for the specific task.
- Do not touch components that have electrical power. Direct contact with a high voltage circuit, or a lower voltage circuit with a high current capability, can be fatal.
- Proper tools and safety equipment must be available. Use them to ensure the safety of personnel and to make sure the given task is done to the specified standards.
- Do not wear jewelry when you work on a system that is powered.
- Use recommended test equipment or their equivalents. Follow the equipment operation instructions. Additional test equipment, lights, etc., may be used as desired, provided the purpose and intent of the specified test is not compromised.
- The leads and the probes of the test equipment must be serviceable. They must be of a sufficient length to put the test equipment at a proper location. The location of the test equipment must provide a full view of the indicator. Make sure there is no tension on the test leads or the probes.
- Give special attention to the WARNINGS, CAUTIONS, and NOTES before a maintenance procedure is initiated. Some maintenance procedures require the use of toxic chemicals, extreme temperatures, and flammable materials.

2-4. STANDARD PRACTICES — ELECTRICAL MAINTENANCE OR REPAIRS

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

NUMBER	NOMENCLATURE
C-136	Caps and/or Plugs
C-156	Caps and/or Plugs

WARNING

UNLESS POWER IS REQUIRED FOR A MAINTENANCE PROCEDURE, DISCONNECT THE BATTERY AND THE EXTERNAL POWER. PUT A TAG ON THE BATTERY SWITCH TO INFORM OTHER PERSONNEL THAT WORK IS BEING PERFORMED.

WARNING

INFORM ALL PERSONNEL THAT WORK IS BEING PERFORMED ON THE HELICOPTER BEFORE YOU SUPPLY POWER TO THE ELECTRICAL SYSTEMS.

1. The procedure that follows will help to avoid injury to personnel and damage to equipment.

a. If an electrical connector is to be left disconnected, install protective caps and/or plugs to protect the contacts from shorts and prevent Foreign Object Damage (FOD). Use either caps and/or plugs (C-136) for Electrostatic Discharge Sensitive (ESDS) equipment, or caps and/or plugs (C-156) for other non-ESDS sensitive equipment.

b. If a circuit breaker must remain open until a maintenance procedure is complete, install a clip or a plastic cable strap under the circuit breaker button. Put a tag on the circuit breaker to inform other personnel not to set the circuit breaker to the closed position.

c. If a switch must remain open or closed until a maintenance procedure is complete, put a tag on the switch to inform other personnel not to touch the switch.

d. Inform all personnel that work is being performed on the helicopter before you supply power to the electrical systems.

WARNING

WHEN USING ANY CHEMICAL OR OTHER MATERIALS, OBEY ALL THE MANUFACTURERS SAFETY RECOMMENDATIONS. REFER TO THE MANUFACTURERS TECHNICAL DATA SHEET, MATERIAL SAFETY DATA SHEET (MSDS), OR ANY OTHER APPLICABLE DOCUMENTATION AVAILABLE THROUGH BELL HELICOPTER TEXTRON OR THE MANUFACTURER OF THE PRODUCT.

2. Sealing, etching, soldering, and some cleaning materials used in the maintenance of electrical equipment contain chemicals that may be toxic to the human body. Observe the manufacturers instructions carefully.

a. Skin, eye, and respiratory protection is required.

b. Always wear chemical manufacturers recommended protective clothing and use safety equipment.

c. Compounds should be mixed in a well ventilated area.

d. If application is in a closely confined area, utilize an exhaust fan to remove fumes or use personal ventilation equipment as recommended by manufacturer.

e. If material is flammable, take all precautions to prevent sparks, arcing, or other sources of ignition.

f. Keep skin contact to a minimum and wash thoroughly after any use of toxic materials.

WARNING

DO NOT USE ANY PROCEDURE CAPABLE OF PRODUCING SPARKS, ARCING, OR ANY OTHER SOURCE OF IGNITION WHEN EXPLOSIVE FUMES ARE PRESENT.

3. The following electrical maintenance procedures require the use of heat capable of inflicting personal injury and damage to equipment.

a. Heat shrink materials are applied to various wiring bundles and connectors for insulation and reinforcement. Use only an explosion proof heat gun, such as the RayChem HT 900 or equivalent, when working on fueled helicopters.

b. Some connections require soldering. Soldering iron tips may have temperatures in excess of 600°F (316°C). When not in use during maintenance operations, keep soldering iron in a holder to prevent burns or damage to other equipment.

WARNING

AVOID ORAL CONTACT WITH HANDS DURING SOLDERING OPERATIONS AND WASH HANDS IMMEDIATELY AFTER SOLDERING OPERATION. THE LEAD CONTAINED IN SOLDER CAN BE A SOURCE OF LEAD OXIDE. LEAD OXIDE IS A POISON THAT CAN RESULT IN A SERIOUS HEALTH PROBLEM. TOUCHING SOLDER FOLLOWED BY SMOKING OR EATING IS A POTENTIAL MEANS OF INGESTING TRACE AMOUNTS OF LEAD OXIDE.

c. Do not use makeshift tools or other unapproved sources of heat when applying heat shrink materials or soldering. The adverse effects are as follows:

- Fire hazard
- Heat damage to adjacent equipment
- Poor quality of workmanship

d. Power to heating tools should be turned off and the equipment immediately removed from the helicopter upon completion of the maintenance procedure.

2-5. STANDARD PRACTICES — ELECTRICAL WORK IN CONFINED SPACES

1. Some equipment installations are in confined areas and access to the test points can be difficult. When you do a test on a powered circuit in a confined area, follow these precautions:

a. Have the applicable fire safety equipment available when you do a maintenance procedure.

b. Before you start work in a confined area, look at the schematics or wiring diagrams of the applicable electrical systems and at the location of the equipment you will test. Make a note of the location of the high voltage areas near the equipment you will test.

c. Be careful around any control cable or control mechanism. Movement of engine or flight controls can cause movement of cables or control rods.

d. For systems not tested, set the applicable circuit breakers to the open position.

2-6. ENVIRONMENTAL SAFETY

Refer to local and regional environmental and safety rules and regulations when performing any maintenance activity.