



Charles County Department of Emergency Services STANDARD OPERATING PROCEDURES

Section 100 - Management & Administration

Vehicles, Apparatus & Equipment - 104.00		
S.O.P. # 104.14	Use, Maintenance, Cleaning and Storage of Rope, Webbing, Rescue Harnesses and Related Rescue Equipment	PAGE: 1 OF 6
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104.14.01 Purpose

To establish standards for personnel using rope, webbing, harnesses and related rescue equipment with regards to use, maintenance, cleaning and storage.

104.14.02 Cited Materials

- NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services
- Occupational Safety and Health Standard Title 29 CFR 1910.146
- ANSI Z359.11
- SOP #400.01 - Personal Protective Equipment

104.14.03 Responsibility

1. It is the responsibility of the Department to provide proper personal protective equipment to its personnel and train them on its proper use.
2. It shall be the responsibility of all department officers and uniformed personnel to comply and enforce the regulations of this SOP.
3. It is the responsibility of all down range personnel operating in a hazardous environment or potentially hazardous environment to don the proper PPE.
4. It is the responsibility of the officer in charge to ensure that all down range personnel operating in a hazardous environment or potentially hazardous environment to don the proper PPE.
5. It is the responsibility of the Special Operations Coordinator to facilitate the preventative and annual maintenance of the Department's ropes, harnesses and related rescue equipment.
6. It is the responsibility of every uniformed employee to care and maintain their issued harness.



Charles County Department of Emergency Services STANDARD OPERATING PROCEDURES

104.14.04 General

All rope, webbing, harnesses and related rescue equipment shall comply with the provisions of NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services that was in effect at the time the equipment was purchased. Said equipment shall also comply with the applicable rules, regulations, and standards established by other appropriate agencies.

104.14.05 Policy

1. It is the policy of the Department that all personnel expected or likely to respond to, and function in, areas defined as high angle or potentially high angle hazardous environments, confined spaces or potentially confined spaces, swift water or potentially swift water environments shall be equipped with, and trained in, the proper use and maintenance of ropes, webbing, harnesses and related rescue equipment.
2. Department rope, webbing, harnesses and related rescue equipment shall be inspected as outlined in this and in accordance with NFPA 1983: Standard on Life Safety Rope and Equipment for Emergency Services.
3. Rope, webbing, harnesses and related rescue equipment or their component parts, which are observed to be worn, defective, or damaged, shall be removed from service immediately and a suitable replacement item or part shall be provided.
4. Documentation for the inspection of ropes and harnesses shall be maintained by the Special Operations Coordinator.
5. Rope that has been deemed unsuitable as life safety line shall be separated from working rope and may be marked and used as utility line only.
6. Harnesses that have been deemed unsuitable for rescue shall be separated from working harnesses and may be destroyed for disposal or used for training on manikins only.

104.14.06 Operational Guidelines

1. **Rope**
 - a. Uses include rappel line, lowering line, safety belay, litter tag line, or in a mechanical advantage pulley system. It is not intended to be used as a tow rope, utility line, etc.
 - b. All rope unless designated as utility line shall be treated and maintained as life safety line.
 - c. Rope construction shall be nylon, low stretch kernmantle:



Charles County Department of Emergency Services STANDARD OPERATING PROCEDURES

- i. With an inner core and an outer sheath,
 - ii. The outer sheath fully protects the inner core;
 - iii. Seventy-five (75%) to eighty-five (85%) of the rope's strength comes from the core dependent upon the manufacturer; and
 - iv. Wicked or capped on both ends.
- d. Rope specifications should be a minimum of:
 - i. Diameter: $\frac{1}{2}$ " (12.7 mm),
 - ii. Strength: 9,000 pounds dry;
 - iii. Lengths: 100' for most uses, up to 600'.
- e. Rope maintenance should consist of:
 - i. Visual inspection after each use for damage to the sheath, dirt, or mildew,
 - ii. Tactile inspection by feeling for soft spots to the rope's core by pulling the rope between the thumb and index finger.
- f. Care of rope should consist of:
 - i. Washing with a mild non-chlorine based detergent and water,
 - ii. Hang loosely and allow to air dry out of direct sunlight;
 - iii. Once dry, it should be stuffed and not coiled into a clean rope bag; and
 - iv. Stored in a dry dust-free place with no exposure to chemicals and direct sunlight.
- g. Best practices for rope are:
 - i. NEVER walk or stand on the rope,
 - ii. Don't drop rope from great heights when it can be carried down;
 - iii. Don't drag rope across ground or apparatus bays;
 - iv. Pad all edges;
 - v. Avoid nylon passing on nylon; i.e., rope passing over itself, another rope or webbing; and
 - vi. Keep all rope and webbing material out of petroleum and alkaline products, and if forced to use in applications where contamination will occur, retire after use.

2. Webbing

- a. Uses of webbing are anchor slings, gear slings, harnesses and lashing.
- b. Construction of webbing shall be nylon, spiral weave, tubular.
- c. Specifications for webbing should be a minimum of one (1) inch wide with a strength of 4,000 pounds.



Charles County Department of Emergency Services **STANDARD OPERATING PROCEDURES**

- d. Maintenance of webbing is the same as rope.
- e. Care of webbing is the same as rope.
- f. Best practices for webbing are the same as rope.

3. Accessory Cord

- a. Uses include loops of 8 mm accessory cord (AC) can be attached to a host rope by a prusik hitch to form attachment points for pulleys. Long loops of 6 mm AC can be tied to allow their use as "soft" ascenders to climb a host rope.
- b. Construction of AC shall be nylon, low stretch, kernmantle.
- c. Specifications of AC shall be a minimum of 6 mm to 9 mm, depending on application.
- d. Maintenance of AC is the same as rope.
- e. Care of AC is the same as rope.
- f. Best practices for AC are the same as rope.

4. Carabiners

- a. Used to link various pieces of gear together, or to add friction to a system.
- b. Construction should be a locking steel, pin type, not lock sleeve dependent or a locking, aluminum, pin type, not locking sleeve dependent.
- c. Specifications should be a minimum of 9,000 pound breaking strength for steel and 5,500 pounds breaking strength for aluminum.
- d. Care includes washing with a mild soap and water as needed.
- e. Best practices for carabiners are:
 - i. Keep clean,
 - ii. Don't drop or throw;
 - iii. Load only along the long axis and not the side;
 - iv. Always lock the gate; and
 - v. Inspect for cracks, worn spots, and smooth operation.

5. Pulleys

- a. Used to reduce friction, change direction, and to gain a mechanical advantage.
- b. Construction should be of sealed ball bearings with anodized aluminum sides.
- c. Specifications should be a minimum of two (2) inches and four (4) inches in size with a 6,000 - 8,000 pound breaking strength.
- d. Care includes washing with a mild soap and water as needed.



Charles County Department of Emergency Services STANDARD OPERATING PROCEDURES

e. Best practices for pulleys are:

- i. Keep clean,
- ii. Don't drop or throw;
- iii. Inspect for smooth operation and/or elongated holes.

6. Rescue Harnesses

a. Uses of rescue harnesses are essential components of all fall protection systems.

Harness Types include:

- i. Class I - Body Belts
 - ii. Class II - Seat Harnesses
 - iii. Class III - Full Body Harnesses
 - iv. Class IV - Suspension Belts
 - v. Chest Harnesses
 - vi. Dog Lift Harnesses
 - vii. Rescue Triangle Harnesses
- b. Construction of rescue harnesses vary dependent upon use and manufacturer.
- c. Specifications for rescue harnesses vary dependent upon use and manufacturer.
- d. Maintenance of rescue harnesses is the same as rope.
- e. Care of harnesses is the same as rope.
- f. Best practices for rescue harnesses:
- i. Fabric portions of the harness are the same as rope.
 - ii. Hardware portions of the harness are the same as carabiners.
 - iii. As most rescue harnesses come in sizes, rescuers should always use a harness that best fits their weight, size and body style.
 - iv. If a "universal" fit harness is to be used, always pull webbing tight and tuck the loose end.
 - v. Prior to use, rescuers should have their rescue partner double check the fit and security of their harness.

104.14.07 Training

1. All personnel expected to use rope, webbing, harnesses or related rescue equipment shall be trained on its proper use.
2. Training will be scheduled on the use and maintenance of rope, webbing, harnesses or related rescue equipment
3. Training and drills in the use of rope, webbing, harnesses or related rescue equipment shall be provided which simulate as near actual emergency conditions as possible.



Charles County Department of Emergency Services **STANDARD OPERATING PROCEDURES**

104.14.08 General Cautions

1. Make sure all knots are tied and dressed correctly.
2. Maintain at least 15:1 safety margin when not belayed.
3. Belay loads when safety margin is less than 15:1.
4. Rescuers shall not operate with less than a 10:1 safety margin.
5. Rescuers shall not approach an edge without being tied in and communicating with rescuers below.
6. Rescuers shall place victims in harness during rope born rescues.
7. Rescuers shall wear appropriate the appropriate level of clothing and PPE when working with ropes and related rescue equipment:
 - a. Seat and chest harness,
 - b. Helmet;
 - c. Approved boots;
 - d. Self-rescue gear;
 - e. Safe cutting device;
 - f. Eye protection; and
 - g. Gloves.