MARLINESPIKE

MARLINESPIKE SEAMANSHIP

1. Rope - Manufactured from fiber, wire or a combination of the two
2. Classification

    a. Fiber rope - Commonly called line; fashioned from natural or synthetic fibers

        (1) Measured by circumference
        (2) Types of construction

            (a) Twisted
            (b) Braided
            (c) Plaited

        (3) Types of fiber rope

            (a) Natural - Manila, cotton and hemp
            (b) Synthetic - Nylon, polyester and polypropylene

                (1) Nylon - Most common, 3X strong as fiber, lasts 5X as long

            (c) Aramid - 4 stranded Kevlar

                (1) Construction - Wire rope-type consisting of four strands of aramid (Kevlar) wrapped around a central core. The inner core is constructed of polypropylene with an aramid jacket. This core does not carry any of the load. The four surrounding strands of aramid are jacketed with a polyester and aramid braid.

                (2) Properties -

                Aramid lines stretch less than 6% at breaking strength, compared to 30-65% stretch for other synthetic lines, therefore is less prone to snapback.

                Aramid lines are substantially smaller, lighter and easier to

handle than nylon or polyester rope of equivalent strength, therefore requires fewer line handlers.

(3) 3 times more expensive than conventional synthetic mooring lines and more susceptible to chaffing.

b. Wire Rope

(1) Measured by diameter.
(2) Construction - Individual wires are laid together to form strands and strands are laid together to form the wire rope.
(3) Wire rope is designated by the number of strands per rope and the number of wires per strand (e.g., 6x19).
(4) Large number of small wires - High flexibility but less resistant to abrasion.
(5) Small number of large wires - Stiff, low flexibility, but more resistant to abrasion.
(6) Cores

(a) Single wire strand adds strength.
(b) Fiber adds flexibility.

(7) Uses for wire rope

(a) Galvanized - Standing rigging, some hoisting.
(b) Uncoated - General hoisting.
(c) Phosphor bronze - Non-corrosive, nonmagnetic (tempest), lifelines.
(d) Stainless steel - Non-corrosive, required on ships.
(e) CRES - (Corrosion Resistant Steel) - Lifelines, flight deck nets.

c. Combination lines - Commonly referred to as “spring lay”

(1) Measured by circumference.
(2) This rope is composed of 6 main strands of fiber, wire rope interwoven, and laid around a fiber core.
(3) Normally used for mooring lines and added strength in case of heavy

weather, spring lay may also be used for towing alongside by tugboats.

(4) Fiber rope adds flexibility and elasticity.

4. Terms

a. Hawser - Heavy line, over 5 inches in circumference, used for towing or mooring.

b. Small stuff - Fiber line less than 1 3/4 inches in circumference.

c. Marline - Two-strand, tarred hemp small stuff.

d. Bight - A loop of line or chain.

e. Bitter end - Free end of a length of line, wire, chain or cable.

f. Eye - Closed loop in the end of a line.

g. Marlinespike - Tapered steel tool used in splicing wire.

h. Fid - Tapered wood tool used in splicing line.

i. Coil - Lay down a line in circular turns on top of one another.

j. Flemish - Coil a line flat on deck.

k. Fake down - Lay out a line in long, flat bights.

l. Heaving line - Light, weighted line thrown across to a ship or pier to acts as a messenger for a mooring line. A lightweight neoprene ball is used to weight heaving lines.

m. Mousing - Light line across a hook to prevent a sling from slipping off of it or a pin from backing out.

n. shot line - Light nylon line used in a line-throwing gun (colored orange).

o. Bolo - Nylon line with a lead weight in canvas or leather, thrown from ship to ship or from a ship to a pier.

5. Proper care and use of lines

a. Natural fiber rope stowage:

(1) Natural fiber rope is subject to deterioration from heat, sunlight, mildew rot, exposure to chemicals, paint and oils.

(2) Stow all fiber rope away from harmful substances.

(3) The best stowage location for fiber line is in a dark, dry, cool, well ventilated area.

b. Synthetic fiber rope stowage:

(1) Affected most by sunlight, fluorescent light and most chemicals.

(2) Nylon - Sensitive to all light radiations and acid chemicals.
(3) Polyester - Sensitive to sunlight and caustic (alkaline) chemicals.

c. Natural fiber rope signs of aging:

(1) Turns yellow or brownish and becomes brittle with time.
(2) Loss of strength (1-2% per year of stowage).
(3) Major concern is not with loss of strength, but with brittleness.
(4) The age of fiber rope is determined by examining the rope's identification marker which is located in the rope strand.
(5) Rope greater than 5 years old

(a) Do not use for critical operations or those involving personnel.
(b) Normally used for lashing, fenders and matting

d. Synthetic fiber rope signs of aging:

(1) White nylon

(a) Turns lemon-yellow or pink.
(b) Becomes stiff when stored in warm, humid areas.
(c) Becomes flexible when tensioned, with no breakage or bending strength loss.

(2) Colored nylon - Not authorized for outdoor marine use because it deteriorates rapidly.
(3) Polyester - Loses very little strength due to exposure.
(4) Polyethylene and Polypropylene - Deteriorate rapidly when exposed to sunlight on a continuous basis. Over a period of three months, it will lose 40% of its strength.

e. Aramid Fiber Rope

(1) If the jacketed cover of any strand of the aramid line is abraded or worn down to the extent that inner fibers are visible but not damaged, the strand(s) or entire rope may be served with marline or synthetic cord.
(2) If the inner fibers are damaged, that section of line should be cut out,

and the line respliced.

(3) If a hockle develops, lay the rope out, and from the end nearest the hockle, rotate the rope in the direction which would tend to unlay the rope. As the rope loosens, work the looseness back into the hockle and repeat as necessary until the hockle has worked its way out.

(4) Since aramid line is similar in construction to wire rope, it is stored on wire reels in the same manner as wire rope.

B. DECK EQUIPMENT

1. Padeye - A plate with an "eye" attached, welded to the deck to distribute the strain over a large area and to which a block can be hooked or shackled, also used in towing operations

2. Lifelines - Lines erected around the edges of decks; Referred to as follows:

a. Top - Lifeline
b. Middle - Housing line
c. Bottom - Foot rope
d. Snaking - Netting stretched between the deck and the housing line or foot rope to prevent personnel and objects from being washed overboard

Safety Note: Ensure that all lifelines are in place and in good condition.

3. Paint stage - Platform rigged over-the-side to support personnel
4. Boatswain's chair - Used for sending only one person over-the-side

a. Safety precautions:

(1) Personnel over-the-side must wear inherently buoyant life preservers.

(2) All boatswain's chairs must have a hand-tended safety line tended from the deck above.

(3) Safety lines should never be secured to lifelines.

5. Jacob's ladder - Flexible, portable ladder with ropes and wooden rungs, slung over-the-side temporary use, commonly used for access to small boats secured to boat booms

6. Boat boom - A spar swung out from a ship's side permitting small boats to ride safely alongside a ship while at anchor
7. Pilot's ladder - Flexible, portable ladder that is usually made of metal (sturdier than Jacob's ladder)
8. Sea ladder - Rigid, portable ladder that may be mounted and secured to the side
9.. Accommodation ladder - Rigid, inclined ladder rigged to the side of the ship to provide a convenient means for boarding or leaving an anchored ship.