FAST ROPE INSPECTION MANUAL

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Revision History

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1 Introduction

- This instruction details the initial receipt inspection, pre-issue inspection and maintenance procedures for Fast Ropes.
- These fast ropes are designed to allow up to five (5) personnel (120 kg each - person/equipment), to rapidly descend in a controlled manner from a hovering aircraft. This technique, using gloved hands and boots, enables friction braking and is similar to that used on a fireman's pole. Following the descent, there may be a requirement to jettison the rope.

2 Description

- The complete Fast Rope Assembly, manufactured by Jeyco is a non-rotating synthetic rope of 8 strand plaited spun 'Nylon 6', olive drab in colour, with a nominal diameter of 50 mm.
- The upper end has a plasma rope splice attachment (Ref fig 1-1). The splice is constructed using four (4) continuous strands of 3 mm Plasma rope through six (6) plaits of the 50 mm Fast Rope. The soft eye produced by the splice allows for the improved attachment of the rope to the aircraft and a quicker and easier release of the rope to meet all operational/training requirements. The lower end of the rope is whipped to a minimum of six inches to prevent unraveling. Each rope has a Safe Working Load (SWL) of 1380 lbs (627 Kg). Each rope has an individual serial number for identification and servicing purposes.

- **Figure 1-1 Plasma rope splice attachment for Fast Ropes.**

3 Rope life

- Fast Ropes are subject to a Shelf Life restriction of six (6) years (from date of manufacture). Once introduced to service, each fast rope has a Service Life of four (4) years (from date of introduction to service) and is not to be used past this date, regardless of the condition of the rope. NB. Shelf Life is defined as a specified time period that an item may remain unused after procurement, prior to being introduced into service. Service Life is defined as a specific time period that an item may remain in use after being introduced into service, e.g., a fast rope that is introduced into service immediately after procurement has an actual life of just four (4) years and is to be withdrawn from service and disposed of at the end of this time. A fast rope may sit on the shelf for any period up to six (6) years, after which the four (4) year service life shall take effect. The cumulative life of a fast rope is not to exceed ten (10) years.

4 Tabulated Data

- Tabulated data for Fast Ropes are listed in table 1-1.

Table 1-1 Equipment tabulated data

FAST ROPE	
Material	Staple nylon 6 melt spun olive drap water repellent finish
Base yarn	6500 Denier
Base yarn twist	140 +/- 14 twists per meter
Yarns per strand	19
Rope diameter	50 mm (nominal)
Minimum Guaranteed Breaking Load	7600kg
Actual Breaking Load	11,000kg
Construction	4 pairs of strands formed into 8 strand plait
Weight	940grams per meter when measured at zero tension
Shelf life	6 years
Service life	4 years
Cumulative Life	10 years

Table 1-2 Equipment tabulated data Plasma Modified Head Configuration

PLASMA MODIFIED HEAD CONFIGUATION	
Material	3MM 12 Strand Plasma
Minimum Guaranteed Breaking Load	8600kg

5 INSPECTION PROCEDURE

- Technical Inspections shall be performed by suitably qualified personnel appointed by the correct authority.
- Before use inspections should include; in storage, pre-pack, rigger check, pre-issue inspections and after repairs and modifications are made.
- After use inspections should include shakeout, cleaning, drying and storage.
- Stretching: Repeated loading can temporarily elongate the rope. This can be identified by a reduction in the ropes diameter. It is important that the rope be allowed to recover over a six hour period prior to being coiled for storage.
- Overall inspection. An overall inspection will be made of Fast Ropes assembly items to ascertain the following:
- **Marking and paint.** Inspect each assembly and associated components for faded, illegible, obliterated, or missing data, identification numbers, and warning marks; and
- **Assembly completeness.** Ensure the assembly is complete and that no components are missing and the rope length is correct plus or minus 3 feet;
- **Operational adequacy.** Check the item components to ensure proper assembly, which includes attachment and alignment and that the assembled product functions in the prescribed manner.
- **Foreign material and stains.** Inspect each assembly and related components for the presence of dirt or similar type foreign material. Also check for evidence of mildew, moisture, oil, grease, or other contamination.

- Table 1.2 is an example of a Checklist that can be used in your Inspection Procedure.

Table 1-2 Inspection checklist

KEY: **B: -** Before use inspection
A: - After use inspection
R: - After Minor repair

Item no.	Interval			Item to be inspected and FR Serial Number	Procedures
	B	**A**	**R**		
					Ensure the assembly is complete with no components missing.
					Inspect the rope serial number and logbook to ensure it is within life of type.
					Inspect the full length of the rope for excessive wear. Worn areas will have a very shiny appearance.
					Inspect for dampness, fungus, dirt, acid, grease, oil, foreign material, burns, cuts, breaks, frays and pulled loops.
					Inspect the whipping covering the lower 150 mm (6 in), of the rope is secure and that the heat sealed lower end of the rope is intact and is not cracked.
					Information data block: inspect for illegibility of data.
					Inspect for kinks or twists, heavy chaffing or seriously worn surface areas, cut, broken or frayed strands (outer and inner strands).
					Inspect for surface fusion or melted strands.
					Inspect for evidence of chemical exposure.
					Inspect for evidence of splice movement and ensure that the splice has four woven loops on each rope end.

6 Shakeout and Airing

Shakeout of Fast Ropes

To shakeout Fast Ropes, the following is to be performed:

- lay the assembly or related components on a clean level surface; and
- remove all debris from the Fast Ropes by vigorous shaking or by brushing with a dry soft-bristle brush.

7 Airing

- Man made fibre ropes are resistant to mildew and ultra violet radiation damage, however should not be exposed to either if possible. Fast ropes should not be exposed to fumes or chemicals where possible and can be stored wet however should not be coiled. Fast Ropes are to be aired and stored in their carry box on completion of use.
- Fast Ropes may be aired either indoors or outdoors in dry weather. Airing may be accomplished by suspending or elevating the item/s in a manner, which would allow entire exposure to the circulation of air. If the shakeout facilities are inadequate for airing, the item/s may be suspended or elevated at several points or by draping over suitable type objects, which would not cause damage. Fast ropes are not to be stored in areas with excessive heat.

8 CLEANING AND DRYING

General

- Fast Ropes are to be inspected after each use for dirt or other foreign material. Subsequent cleaning and drying of the equipment may be required to prevent a possible malfunction or deterioration of the item/s.

Cleaning

- The practice of cleaning Fast Ropes should be kept to a minimum and performed only when it is necessary to eliminate a potential malfunction, or the possibility of material deterioration. The method of cleaning to be used must be compatible with the type of material to be cleaned and the nature of the substance to be removed. In addition, the cleaning process should be limited to the soiled area only.

Washing

- Fast ropes are to be washed in fresh water within 24 hours of being immersed in or exposed to salt water within 24 hours. The rope is to be and agitated by hand until there is no obvious salt water residue remaining. This can be achieved by either a visual inspection or taste testing. Fast ropes that have been contaminated by mud and dirt are to be spot cleaned using fresh water and rinsed until there is no obvious dirt remaining.

Drying

- Fast Ropes that are wet or damp are to be suspended or elevated in a ventilated room, or in a heated drying room. The rope can either be draped or hung by the plasma attachment point. Item drying time may be reduced through the use of electric circulating fans. When heat is used, a temperature of between 18 degrees C and 43 degrees C is required. This temperature range is not to be exceeded.

9 DEFFECTS AND DAMAGE

- Should any defects or damage be discovered on a fast rope during any inspection or storing process, they should be labeled with a DO NOT USE TAG and processed for repair.
- Minor damage can be repaired on site; Major Damage should be reported to the appropriate authority for approval and necessary action.

MINOR DAMAGE

- **Dirt , Oil or Grease**; may be removed buy washing with a mild detergent (dish washing liquid) and rinsed in fresh cold water(only small isolated areas can be washed, larger areas of the rope contaminated with oil or grease are to be removed from service);

- **Rust**: does not harm the rope but should be removed buy washing in fresh water. Rust only detracts from the ropes appearance.

- **Pulled Loop:** not exceeding 25mm in height.

MAJOR DAMAGE

- **Excessive wear**: the presence of a fibre nap or whiskering fuzz distributed uniformly on the strand surface is an indication of normal wear. Some disarrangement or breaking of the out side fibre is normally unavoidable and if not extensive, is harmless. In extreme cases the strands become so worn that their outer face are flattened and yarns severed are to be removed from service.

- **Glazing**: is indicated by the presence of a hard layer of fused fibres on the surface of the rope. The cause is friction-generated heat near to, or above the melting point of the fibre when the rope is surged under a heavy load. Fast ropes with large areas of fusion or multiple small areas of fusion are to be removed from service;

- **Pulled Loop**: exceeding 25mm in height.

- **Cutting**: is identified by protrusions of several yarns along the line of the cut. If cuts are identified during any inspection the rope is to be returned to the manufacturer for splicing;

- **Crowsfooting**: localised distortion or a back twist in a fibre is known as crowsfooting or hockling. Crowsfooting can weaken the rope and the strands are to be rethreaded into the rope. The rope is to be removed from service and returned to the manufacturer for repair if crowsfooting is in excess of that shown in figure 1-2;

- **Stretching**: Repeated loading can temporarily elongate the rope. This can be identified by a reduction in the ropes diameter. It is important that the rope be allowed to recover over a six hour period prior to being coiled for storage;

- **Chemicals**; should be avoided to prevent any undue wear on the rope. Alkalis, solvents, acids and paints will damage the ropes over time. Ropes returned that have been contaminated are to be removed from service

Fast Ropes are to be rejected for service and returned to the supplier if any of the following is evident.

- excessive wear;
- cuts above allowed limitations;
- abrasions above allowed limitations;
- chemical contamination;
- un-secure whipping;
- cracked lower end heat sealing; and
- large areas of oil or grease are present on the rope.
- faded or incomplete identification number

EXAMPLES OF MAJOR REPAIR







10 REPAIR PROCEDURE

Repairs to Fast Ropes are restricted to the following tasks:

- **Pulled Loops.** The number of pulled loops is limited to 1 loop per 3 meter section of Fast Rope with a maximum length of 25mm.The loop is to be drawn into the body of the rope using a thin wire hook passed through the rope from the opposite side. The repairs are to be recorded in the Inspection Checklist so that future repairs can be assessed to ensure that they are within limitations.

EXAMPLES OF MINOR REPAIR