NATO STANDARD

ATP-3.2.49.2.4

AERIAL RECOVERY EQUIPMENT AND TECHNIQUES FOR HELICOPTERS

Edition A, version 1

SEPTEMBER 2022

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED TECHNICAL PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

INTENTIONALLY BLANK

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

29 September 2022

1. The enclosed Allied Technical Publication ATP-3.2.49.2.4, Edition A, version 1, AERIAL RECOVERY EQUIPMENT AND TECHNIQUES FOR HELICOPTERS, which has been approved by the nations in the MILITARY COMMITTEE LAND STANDARDIZATION BOARD, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 2970.

2. ATP-3.2.49.2.4, Edition A, version 1, is effective upon receipt.

3. This NATO standardization document is issued by NATO. In case of reproduction, NATO is to be acknowledged. NATO does not charge any fee for its standardization documents at any stage, which are not intended to be sold. They can be retrieved from the NATO Standardization Document Database ((https://nso.nato.int/nso/) or through your national standardization authorities.

4. This publication shall be handled in accordance with C-M(2002)60.

Dimitrios SIGOULAKIS
Major General, GRC (A)
Director, NATO Standardization Office

INTENTIONALLY BLANK

RESERVED FOR NATIONAL LETTER OF PROMULGATION

INTENTIONALLY BLANK

RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

INTENTIONALLY BLANK

RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
BEL	Implementation is not possible due to NH- 90 not being considered as operational anymore.
BGR	Rotary aircraft which are in service in the Bulgarian Air Force have Under Sling Load capability limited up to 3000 kg.
CAN	STANAG 2970 is in line with current RCAF training and procedures.
CZE	CZE has not any suitable helicopters and equipment available for transportation of damaged helicopters in the hookup operations.
EST	Estonian Defence Forces does not have this type of rotary wing assets, which are used to conduct aerial recovery operations. Estonian Defence Forces operate currently only light helicopters.
GBR	I have considered the content in conjunction with ATP 3.2 and ADP Land Ops Pt 4 - Intelligence and have found that both books are consonant with the wider national and multi-national doctrine.
HRV	Croatian Air Force will reconsider the possibility of implementation of subject standard after the promulgation of its new version.
MNE	This standard includes procedures for recovery helicopter from environment after emergency landing or wreckage. Now, we don't have equipment for this kind of operation so this standard cannot be applied.
SVK	At present the Armed Forces of the Slovak republic do not have capabilities for aerial recovery of aircraft.
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

INTENTIONALLY BLANK

TABLE OF CONTENTS

INTENTIONALLY BLANK

Chapter 1 INTRODUCTION

1.1. AIM

The aim of this agreement is to provide standardized equipment performance requirements and recovery techniques to allow member nations to aerially lift downed helicopters and light fixed wing aircraft from remote or inaccessible sites.

1.2. AGREEMENT

Participating nations agreed that the criteria established in this publication will apply in the selection of hardware and methods for aerial recovery of aircraft. Participating nations further agree to furnish verified rigging procedures at the site of the downed aircraft for use by another nation in carrying out aerial recovery of the downed aircraft.

1.3. BACKGROUND TO THE AGREEMENT

Aerial recovery is one of three options in dealing with a downed aircraft. After assessment of the damage or fault by a qualified technician of the owning nation and depending upon the tactical situation, the helicopter can either be:

a. Repaired sufficiently to enable the aircraft to return to operational duties, or fly to a location where a permanent repair can be affected.

b. Recovered by air or surface to a safer location for repair.

c. Cannibalized for useful components and then abandoned or destroyed, if considered necessary.

INTENTIONALLY BLANK

Chapter 2 GENERAL REQUIREMENTS

2.1 GENERAL REQUIREMENTS

Aerial recovery equipment and techniques are selected and provided for the purpose of recovery of NATO Forces' aircraft and shall have the capability of being able to recover and evacuate disabled aircraft as quickly and safely as possible. Aerial recovery techniques shall include procedures such as preparing the aircraft for movement, connecting it to a suitable helicopter with the sling/strop, and transporting it to a maintenance area. All national equipment required to perform recovery operations shall be identified and maintained to ensure immediate availability. Verified rigging procedures for the downed aircraft will be provided by either being carried in documents that fly with the aircraft or being brought to the scene by the technical inspector from the owning nation who performs the "triage" outlined above.

INTENTIONALLY BLANK

Chapter 3 DETAILED REQUIREMENTS

3.1 RIGGING PROCEDURES

Verified rigging procedures shall be established for each NATO aircraft designed for aerial recovery. Verification may be by prior successful use or by structural analysis of the aircraft lift provisions, load analysis of all lifting components and a flight demonstration of the representative airframe. Rigging should be such as to produce an attitude for the recovered aircraft which is stable in forward flight. Appropriate devices must be provided to protect both the airframe and the lifting devices from damage in flight.

3.2 EQUIPMENT

The above techniques for aerial recovery can be accomplished using numerous types and combinations of equipment, providing that connecting interfaces and performance characteristics are compatible. The equipment must provide safe restraint and in-flight suspension of the aircraft to be recovered or evacuated. The equipment required for an aircraft recovery will depend on the type of aircraft to be recovered, its weight, the extent of structural damage and the rigging procedures to be used. The following type of devices will normally allow a variety of aircraft to be recovered with little or no additional damage to the aircraft to be recovered:

a. Pendant/Strop Assembly. A pendant or strop is normally required to ensure adequate separation between the recovery helicopter and the aircraft being recovered. Dual pendants/strops may also be used to reduce the lateral angle on fore and aft support legs or for tandem hook riggings. Pendants/strops can also be used to facilitate hook-up operations.

b. Sling Leg. Adjustable sling legs should be provided to allow the recovered aircraft to be rigged at the proper attitude (normally slightly nose down) for the best stability at flight speeds

c. Spreader Bars. Spreader bars may be required to ensure sling legs clear the airframe, engines, suppressors, etc. when fuselage lift fittings are located at places other than the rotor or top of the fuselage. When recovering larger aircraft with fuselage support bands, spreader bars may be positioned across the fuselage. The length of spreader bars should be at least equal of the fuselage width to reduce the crushing forces on the side of the fuselage. For smaller aircraft, the spreader bar can be used aligned with the centerline of the fuselage and connected to fore and aft support bands. This arrangement controls the spread of the support bands and allows for correcting the attitude of the recovered aircraft by adjusting the legs above the spreader bar.

d. Fuselage Support Bands. Fuselage support bands must be used when adequate lift provisions are not available or their structural integrity is questionable due to the crash. When support bands are used care must be taken in placing and securing them in locations which will not result in additional damage to the aircraft. The following additional equipment is required when fuselage support bands are used:

(1) Load Spreaders. Load spreaders are required for those aircraft where structural airframe members do not coincide with the required fuselage support band rigging stations. They are then used to distribute the fuselage support band load over a larger area, allowing more freedom in selecting rigging locations and reducing the risk of further structural damage to the disabled aircraft. Means must be provided for securing the support bands to the load spreaders.

(2) Positioning Straps. Adjustable length straps with quick connect attachment hooks at each end or other suitable securing device should be provided to secure either the fuselage support bands or the load spreader and support bands to prevent slippage of the support bands from their proper position on the aircraft fuselage.

(3) Anti chafe Pads. These pads are used in areas where support bands would normally contact the fuselage to minimize the risk of abrasion.

e. Rotor Head Sling. Rotor head slings are used for hoisting helicopters with two bladed rotors by forming basket configurations at the grip assembly of each rotor blade. This method may be used in-lieu of fuselage bands when other hoisting provisions are inadequate; however, some damage to rotor controls may occur. This method should not be used for hoisting mission ready aircraft, i.e. seafaring operations. For those helicopters where rotor head lifting eyes or specialty type lifting slings are provisioned, these should be used in preference to fuselage bands, and may be used for mission ready aircraft.

f. Gust Locks. These plates are used to secure control surfaces, such as, ailerons, elevators, and flaps which may influence the stability of slung fixed wing aircraft.

g. Spoiler. Metal angles or other devices should be attached to all wings or other airfoils to minimize the aerodynamic lift of these surfaces. This lift can cause dangerous instability at normal recovery flight speeds.

h. Drogue Chutes. Drogue chutes may be used to maintain directional stability for the slung aircraft when other methods, such as, attitude adjustments or use of tandem hook rigging configurations are not successful in providing a

stable load. Drogue chutes should be no larger than required to maintain directional stability. A 1.5 to 2.0 meter diameter chute is adequate for most aircraft. All drogue chutes should be equipped with a swivel attachment to prevent the chute from winding up due to down wash.

i. Static Discharge Probe. A device should be provided to ground the static charge from the recovery helicopter prior to hook-up.

j. Handling Lines. Handling lines may be fitted to fuselage attachment points to assist in guiding the aircraft from and onto the ground.

3.3 TYPES OF MISSIONS

The primary purpose of aerial recovery shall be to transport downed aircraft from remote or inaccessible sites without incurring additional damage to the airframe. Other missions are the transportation of repairable airframes from advance/forward areas to rear repair facilities and to expedite loading or offloading of aircraft from offshore ships during seafaring operations.

3.4 ENVIRONMENTAL CONDITIONS

Aerial recovery equipment and procedures shall be capable of being utilized in world-wide environments. Temperature ranges shall be – 30 °C to + 50 °C (- 22°F to + 122 °F). Operations shall be possible at varied types of crash sites including wooded hills, steep gravel slopes, deep snow, frozen soil, thick ice, sand, dust and salt water.

3.5 INTERFACE

The pendant/strop should be compatible with the helicopter cargo hook. Standard interface dimensions have been published in STANAG 3542 - Technical Criteria for the Transport of Cargo by Helicopter.

ATP-3.2.49.2.4(A)(1)