

Helicopter external sling load operations

CAP 426

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Glossary

AOC	Air Operators' Certificate
ANO	Air Navigation Order 2016
AUM	All Up Mass
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication (CAA document)
COSHH	Control of Substances Harmful to Health
CofG	Centre of Gravity
DA	Density Altitude
DG	Dangerous Goods
EEDS	Electrically Initiated Explosive Devices
FM	Flight Manual
HEC	Human External Cargo
HESLO	Helicopter External Sling Load Operations
HF	High Frequency
HMSO	Her Majesty's Stationary Office
HSE	Health and Safety Executive
LOLER	Lifting Operations and Lifting Equipment Regulations 1998
MAUM	Maximum All Up Mass
PA	Pressure Altitude
PPE	Personal Protective Equipment
PUWER	Provision and Use of Work Equipment Regulations 1998
RADHAZ	Radio Hazards
RoA	Rules of the Air Regulations 2015
SERA	Standardised European Rules of the Air
SPO	Specialised Operations
SWL	Safe Working Load
SWR	Steel Wire Rope

Revision history

1. This document updates and replaces CAP 426, Edition 4.

Specific amendments include references to the current Regulations related to Helicopter External Sling Load Operations.

Helicopter external sling load operations

Introduction

- 1.1 Helicopter flying with external sling loads require special precautions to be taken if both the helicopter crew and third parties are to be protected from undue risk. This publication contains advice on various aspects of external sling load operations for the benefit of operators who are considering conducting HESLO for the first time and pilots or persons supervising the securing and detaching of loads.
- 1.2 Reference should also be made to:
- Air Navigation Order 2016 – article 88
 - Commission Regulation (EU) No 965/2012 (Retained EU Legislation) (Air Operations Regulation) Annex VIII (Part-SPO);
 - Air Operations Regulation Annex III (Part-ORO)
Declaration - ORO.DEC.100
Commercial Specialised Operations – ORO,SPO.100
Commercial SPO High Risk Authorisation – ORO.SPO.110
 - Part-SPO, Subpart E: Specific Requirements
Section 1 - Helicopter External Sling Load Operations (HESLO)
Section 2 – Human External Cargo operations (HEC)
 - CAP 428 – Safety Standards at Unlicensed Aerodromes (including Helicopter Landing Sites);
 - Health and Safety Executive (HSE) legislation and guidance contained within the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER); and
 - HSE Provision and Use of Work Equipment Regulations 1998 (PUWER).
- 1.3 HSE information can be accessed from www.hse.gov.uk.
- 1.4 In simple terms the CAA holds the duty of regulation above the point at which the load is released from the helicopter and the HSE legislation applies to the maintenance and inspection of all equipment below the

point of release (except in the case of certain types of Human External Cargo (HEC) operations – refer to SPO.SPEC.HEC.105).

Carriage of Dangerous Goods (DG)

- 1.5 The Operator must have an approval to conduct the carriage of Dangerous Goods in accordance with the Air Navigation (Dangerous Goods) Regulation 2002 and the Air Operations Regulation SPO.GEN.150. The specific requirements relating to the carriage of Dangerous Goods are stated in the current version of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

An extract from Chapter 7 of the above document is reproduced here –

Chapter 7 HELICOPTER OPERATIONS

Note. The requirements in this chapter are in addition to the other provisions of these Instructions that apply to all operators (e.g. Part 7 and Part 1;4).

7.1.1 Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, there may be circumstances when the full provisions of these Instructions are not appropriate or necessary, due to the operations involving unmanned sites, remote locations, mountainous areas or construction sites, etc. In such circumstances and when appropriate, the State of the Operator may grant an approval in order to permit the carriage of dangerous goods without all of the normal requirements of these Instructions being fulfilled. When States other than the State of the Operator have notified ICAO that they require prior approval of such operations, approval must also be obtained from the States of Origin and destination, as appropriate.

7.1.2 When loading dangerous goods for open external carriage by a helicopter, consideration should also be given to the type of packaging used and to the protection of those packagings, where necessary, from the effects of airflow and weather (e.g. by damage from rain or snow), in addition to the general loading provisions of 7;2.

7.1.3 When dangerous goods are carried suspended from a helicopter, the operator must ensure that consideration is given to the dangers of static discharge upon landing or release of the load.

An Operator who intends to carry DG as external cargo must apply to the CAA for a Dangerous Goods Approval. Details of the application process are available on the CAA website - <https://www.caa.co.uk/Commercial-industry/Aircraft/Dangerous-goods/Transport-of-dangerous-goods-and-munitions-of-war/>

Carriage of external cargo

- 1.6 The normal method of carrying external cargo by helicopter is to suspend it from the helicopter by means of an external cargo hook or hooks. Depending upon the helicopter type, the cargo hook is either suspended by cables and/or a frame from the belly of the helicopter or is attached to mountings on or a connection panel within the belly of the helicopter. The loads may be transferred to the main rotor gearbox by means of a load pole.

Carriage of loads from single cargo hooks

- 1.7 The system of employing a single cargo hook for suspending a load is known as “single hook suspension”, whereas the system of lifting a load from a single point on the load is known as “single point lift”. Helicopters operating with a single cargo hook allow for a relatively simple load hook-up process, but once in flight the load is free to twist and orientate into positions of high drag or commence spinning about its vertical axis or take on a swinging motion. The overall effects of the foregoing generally become more pronounced with an increase in the helicopter speed. For this reason, single cargo hook helicopters are frequently unable to exploit their true speed capabilities when carrying external loads.

Certificate of airworthiness limitations

- 1.8 Special advice concerning load-lifting equipment is contained in Flight Manual (FM) supplements applying to those helicopters equipped with hooks or hoists. The limitations, flight handling techniques and details of the representative loads demonstrated at the time of certification constitute basic information concerning the use of the aircraft in the load-lifting role. In the absence of specific details of loads, it should be assumed that only dense loads with predictable aerodynamic characteristics have been carried. In cases where it is intended to carry loads of irregular shape or low density the advice contained in paragraphs 1.52 – 1.61 should be followed to determine the safe flight characteristics.

Operational control and general safety

Nature of cargo hooks

- 1.9 Helicopter cargo hooks are designed to function as “cargo release units”, allowing for the release of a load by remote control, exercised by the pilot from within the helicopter. Most helicopter cargo hooks are of the electromagnetic type, often referred to as electromechanical release units. Although there are differences in appearance, size and design of the various hooks, they all follow the same basic principle of operation. They employ a solenoid unit, housed on the hook casing, which converts electrical energy into mechanical movement, activating the internal mechanism of the release unit so as to open an internal latch. This allows the carrying beam of the hook, known as the load beam, to pivot downwards and release any attached sling, net-lifting ring or similar device.

Use of term “primary hook”

- 1.10 The helicopter cargo hook is generally referred to as the “primary hook”, which provides a simple way of distinguishing it from the terminal hook fitting at the end of any extension strop. The extension strop hook is, in turn, known as the “secondary hook”.

Connector/Coupling facility (extension strops)

- 1.11 The secondary hook on an extension strop provides a means of connection for slings or cargo lifting nets, which for any reason may not be directly attached to the primary hook. Secondary hooks also afford the means of coupling equipment lifting rings and multiple loads.
- 1.12 The extended distance from the helicopter to the load can be advantageous for the following reasons:
- It provides a safe suspension distance for loads, which, because of their size or flying characteristics, pose the risk of striking the helicopter in flight;
 - It affords a means of attaching or landing a load when the helicopter is unable to descend because of surface obstacles such as trees, buildings or ships rigging;
 - It allows the attachment of loads where the primary hook is incompatible with the rigged load;