



Issued: 5 April 2017

Helicopter Operations Flight Planning and Safe Flight Execution

This Safety Notice contains recommendations regarding operational safety.

Recipients must ensure that this Notice is copied to all members of their staff who need to take appropriate action or who may have an interest in the information (including any 'in-house' or contracted maintenance organisations and relevant outside contractors).

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| Applicability: | |
| Aerodromes: | Not primarily affected |
| Air Traffic: | Not primarily affected |
| Airspace: | Not primarily affected |
| Airworthiness: | Not primarily affected |
| Flight Operations: | All Helicopter AOC and PAOC Operators and ATOs conducting professional pilot licence training |
| Licensed/Unlicensed Personnel: | All Helicopter Pilots, Instructors, Examiners and Operations Staff |

1 Introduction

- 1.1 Several helicopter events, including the accidents to Agusta A109E G-CRST¹ in 2013 and AgustaWestland AW139 G-LBAL² in 2014, have highlighted the potential for the conduct of pre-flight planning to have a major impact on the safe outcome of a flight. Similar situations in the USA resulted in specific planning and pre-flight risk assessment requirements being introduced for Emergency Medical Service (EMS) flights there. These requirements were captured in changes to Federal Aviation Regulation (FAR) Part-135 including new sections 615 and 617.³
- 1.2 The purpose of this Safety Notice (SN) is to reinforce to operators, trainers and pilots the essential need for detailed and appropriate pre-flight planning and risk assessment before conducting any flight but in particular those intended to be conducted under the Visual Flight Rules (VFR). The plan then needs to be executed accordingly.
- 1.3 This Safety Notice updates and supersedes SN-2016/002.

2 Background Information

- 2.1 The operator must establish and maintain a system for exercising operational control and supervision over any flight conducted under the terms of its Air Operator Certificate (AOC) or Police AOC (POAC) and in particular to the method for ensuring that the flight can be safely executed. This requirement is also to be met in accordance with EASA-OPS⁴ Part-ORO for

operators of non-commercial complex motor-powered aircraft (Part-NCC and Part-SPO) and commercial specialised operations (Part-SPO). The commander and flight crew have responsibilities and obligations to ensure that a flight is conducted safely. The Operations Manual (OM) informs crews on the company's policy regarding safety and all procedures to be followed. A clear understanding of a company's safety policy and procedures is essential for all concerned.

3 Discussion

- 3.1 Operators are required to document their flight preparation and planning procedures in their OMs. For EASA-OPS operators, this is covered by ORO.GEN.110, ORO.MLR.100 and 101 together with the associated Alternative Means of Compliance (AMC) and Guidance Material (GM). The means of compliance is comprehensive and details the kinds of subjects and information that must be provided so that flight operations can be planned and conducted safely whether under VFR or the Instrument Flight Rules (IFR). The OM procedures must of course meet the requirements detailed in EASA-OPS Part-CAT such as: commander's responsibilities; use of ATS; aerodromes and operating sites; routes and areas of operations; min flight altitudes; flight preparation; meteorological conditions. Similar requirements are also detailed in Part-NCC and Part-SPO.
- 3.2 Planning for IFR flights can be expected to be comprehensive but it is just as important that VFR flights, both by day and night, are afforded similar levels of attention. In considering this, it is perhaps relevant to review the changes made in this area by the Federal Aviation Administration (FAA) for US Helicopter Emergency Medical Services (H)EMS operators, following a detailed review of these operations, as they may contain safety improvements that could also be relevant to wider commercial helicopter operations including those in the UK.
- 3.3 The Air Accident Investigation Branch (AAIB) noted in their report of the accident to the Agusta 109 G-CRST helicopter, that the US proposals relating to pre-flight risk assessment and Visual Flight Rules (VFR) flight planning are worthy of particular consideration in relation to:
 - the decision to accept a flight;
 - continued operation in adverse weather conditions;
 - low level flight in the vicinity of terrain or obstacles; and
 - short notice or en-route changes to flight objectives and planning.
- 3.4 The pre-flight risk assessment is an effective tool to ensure a crew is properly prepared for a flight. Both air and ground stakeholders need to contribute to the risk assessment to ensure flight crew are furnished with all the necessary information to conduct their flight safely. Special attention needs to be applied to weather, obstacles en-route and high ground.
- 3.5 A process such as the European Helicopter Safety Team (EHEST) Pre-departure Risk Assessment tool could make a positive safety impact because its use might prompt pilots to seek management approval before accepting a flight. This is an opportunity for discussion and joint assessment, which can highlight elevated risk factors and require risk-mitigating procedures to be put in place before departure. This tool and description for use may be found at the [EHEST website](#) together with many other useful publications to improve safety - [EHEST Pre-departure Risk Assessment Tool](#).
- 3.6 Additionally, EHEST provides several Safety Management tools including the new "*My Assessment of Risks for Incidents and Accidents*" (MARIA) toolkit available for download at the EHEST [Safety Management website](#).
- 3.7 Commercial pressure often sits behind many occurrences and it is essential that the operator's management system and operational control divorces the commander from this as much as possible. It would be appropriate for the commander to only have dialogue with the company operations department who should in turn be responsible for liaising with the customer before any flight.

4 Review of Revised FARs

4.1 The following information is drawn from the FAR text and it is recommended that operators review the information to ascertain how any details would enhance their own OM procedures. The FAR text below has been adapted slightly to reflect the UK context and adaptations are shown in italics.

4.2 Part-135.615 – **VFR Flight Planning.**

- (a) **Pre-flight.** Prior to conducting VFR operations, the *commander* must:
- (1) Determine the minimum safe cruise altitude by evaluating the terrain and obstacles along the planned route of flight;
 - (2) Identify and document the highest obstacle along the planned route of the flight *making best use of available electronic devices and 'Apps' that portray NOTAMs and obstacles on the planned route;* and
 - (3) Using the minimum safe cruise altitudes in paragraph (b) of this section, determine the minimum required ceiling and visibility to conduct the planned flight by applying the weather minimums appropriate to the class of airspace for the planned flight.
- (b) **En route.** Whilst conducting VFR operations, the *commander* must ensure that all terrain and obstacles along the route of flight are cleared vertically *in accordance with the **Standardised European Rules of the Air.***
- (c) **Rerouting the planned flight path.** A *commander* may deviate from the planned flight path for reasons such as weather conditions or operational considerations. Such deviations do not relieve the *commander* of the weather requirements or the requirements for terrain and obstacle clearance contained *in the operating rules and the Rules of the Air.* Rerouting, change in destination, or other changes to the planned flight that occur while the helicopter is on the ground at an intermediate stop require evaluation of the new route in accordance with paragraph (a) of this section.
- (d) **Operations manual.** Each AOC/PAOC holder must document its VFR flight planning procedures in its operations manual. *Part-NCC and Part-SPO operators should do likewise.*

4.3 Part-135.617 – **Pre-flight Risk Assessment.**

- (a) Each AOC holder conducting *helicopter operations* must establish, and document in its operations manual, an approved pre-flight risk *assessment* that includes at least the following:
- (1) Flight considerations, to include obstacles and terrain along the planned route of flight, landing zone conditions and fuel requirements;
 - (2) Human factors, such as *company and customer commercial pressure,* crew fatigue, life events and other stressors;
 - (3) Weather, including departure, en-route, destination and forecast;
 - (4) A procedure for determining whether another helicopter *operator* has refused or rejected a flight request *from the same customer under the ongoing circumstances;* and
 - (5) Strategies and procedures for mitigating identified risks, including procedures for obtaining and documenting approval of the AOC holder's management personnel to release, *or reject,* a flight when a risk exceeds a level predetermined by the AOC holder *with regard to its SMS.*
- (b) Each AOC holder must develop a pre-flight risk *assessment* worksheet to include, at a minimum, the items in paragraph (a) of this section.

- (c) Prior to the first leg of each helicopter *operation*, the *commander* must conduct a pre-flight risk *assessment* and complete the pre-flight risk *assessment* worksheet in accordance with the AOC holder's approved procedures. The *commander* must sign the pre-flight risk *assessment* worksheet and specify the date and time it was completed.
- (d) The AOC holder must retain the original or a copy of each completed pre-flight risk *assessment* worksheet at a location specified in its operations manual for at least 90 days from the date of the operation.

5 Threat and Error Management

- 5.1 Threat and Error Management (TEM) comprises 'attitudes and behaviours appropriate to safe conduct of flight, including recognising and managing potential threats and errors.' TEM, which is an expected behaviour of any pilot, from student through to professional, is formed of the following components:
- Threat
 - Anticipated
 - Unanticipated
 - Latent
 - Errors
 - Aircraft handling
 - Procedural
 - Communications
 - Undesired Aircraft State (UAS)
 - Aircraft handling
 - Ground navigation
 - Incorrect aircraft configuration
- 5.2 The three categories of threats all have the potential to negatively affect flight operations by reducing margins of safety. The objective of threat management is to gain awareness of the potential threats within the operating environment both prior to and during flight. Understanding what a threat is, and being aware of these threats, enables the flight crew to both plan and execute the flight in a safe manner by selecting the appropriate countermeasure and achieving a safe outcome. One measure of the effectiveness of a flight crew's ability to manage threats is whether such threats are detected promptly enough to enable the flight crew to respond to them before a UAS develops by taking the appropriate actions. Threat management is a building block to error management and UAS management, and provides the most proactive option to maintain margins of safety in flight operations. As threat managers, flight crews are the last line of defence to keep threats from negatively impacting flight operations.
- 5.3 Errors are defined actions or inactions by the flight crew that lead to deviations from organisational or flight crew intentions or expectations. Errors can be divided into slips and lapses, or mistakes. Unmanaged or mismanaged errors, as with threats, have the potential to reduce the margins of safety and could lead to additional errors or UAS. Regardless of the type of error, it is the detection, interpretation and response that influence the potential effect on safety. The objective of error management is the timely detection followed by prompt and appropriate response in flight operations in order for the error to become operationally inconsequential.
- 5.4 UASs are flight crew-induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration, associated with a reduction in margins of safety. UASs that result from ineffective threat or error management may lead to compromising situations and reduce margins of safety in flight operations. UASs can be managed effectively

by flight crews by returning the aircraft to normal operations, or alternatively, they can be mismanaged resulting in additional errors or an occurrence (incident/accident).

- 5.5 The EHEST Training Team have produced Leaflet HE8 on TEM which can be downloaded from their website at [EHEST Publications](#).

6 Recommendations to Operators and Pilots

- 6.1 It is recommended that operators and pilots consider the benefits learned from the experience in the US to enhance their own procedures and in particular the merit of introducing a pre-dispatch checklist based upon the pre-flight risk assessment and consider making use of the free tools provided by EHEST.
- 6.2 Operators should reinforce the current OM guidance to their staff. Particular emphasis on minimum obstacle clearance distances and Minimum Safe Altitude (MSA) should be carried out regularly.
- 6.3 TEM principles and strategies should be reviewed and adopted by all pilots and encouraged through operator training.
- 6.4 Operators should ensure that flight crew maintain their ability to interpret Meteorological information through recurrent training.
- 6.5 It is recommended that TREs and Line Training Captains reinforce all these elements during training and operator proficiency checks (OPC).

7 Queries

- 7.1 Any queries or requests for further guidance required as a result of this communication should be addressed to the operator's assigned Flight Operations Inspector in the first instance.
- 7.2 Otherwise queries should be addressed to the following e-mail address: ISPTechnicalSupportTeam@caa.co.uk.

8 Cancellation

- 8.1 This Safety Notice will remain in force until further notice.

1 [AAIB Accident Report 3/2014 - A109E G-CRST](#)

2 [AAIB Accident Bulletin 10/2015 – AW139 G-LBAL](#)

3 [Federal Register - Helicopter Air Ambulance, Commercial Helicopter, and Part 91 Helicopter Operations Final Rule Notification](#)

4 [Commission Regulation \(EU\) No. 965/2012 – The Air Operations Regulation](#)