# AERONAUTICAL INFORMATION CIRCULAR P 003/2020

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0191-203 2329 (Distribution - Communisis UK)

**Date Of Publication**
16 Jan 2020

**Subject**
Safety

**Cancellation**
P 146/2012

# HELICOPTER PRECAUTIONARY LANDINGS IN DETERIORATING WEATHER CONDITIONS

## 1 Introduction

1.1 Helicopter flight into conditions of deteriorating weather and visibility is a threat that may be encountered at any time of the year in the UK. The dangers of operating in this degraded visual environment (DVE) are never more acute than when the conditions degrade to the point of actual Instrument Meteorological Conditions (IMC). At greatest risk are the smaller 'Visual Flight Rules-only' ('VFR-only') helicopters, i.e. those not certified or equipped for flight in IMC, and especially during the en-route phase of flight. The majority of these helicopters fall into the CS-27/FAR-27 certification category which encompasses helicopters that have a maximum weight of 3175 kg (7000 lb) and with nine or fewer passenger seats and these make up the bulk of the UK general aviation fleet used by private owners, and for self-fly hire.

1.2 The UK element of the European Helicopter Safety Analysis Team (EHSAT), part of the European Helicopter Safety Team (EHEST), conducted an analysis of CS-27/FAR-27 helicopter accidents and incidents in the UK and combined it with Air Accidents Investigation Branch (AAIB) pilot report data over the period 2000-2010. This analysis identified that of the recorded accidents or incidents that occurred following inadvertent flight into IMC, 68% resulted in a fatal accident. The records across Europe as a whole show that over a similar period, 66% of accidents/incidents that occurred following inadvertent flight into IMC led to a fatal outcome. These results serve to clearly emphasise the risks that can be faced by 'VFR' helicopters operating in IMC, whether deliberately or inadvertently. A previous study by the CAA into Helicopter Flight in Degraded Visual Conditions was reported on in CAA Paper 2007/03. Despite the promulgation of material on the threats posed by DVE, the inclusion of bad weather training items into the PPL(H) syllabus and the inclusion of Threat and Error Management training, DVE related accidents and incidents remain prevalent today.

1.3 Although encountering actual IMC poses the greatest threat, it is the loss of sufficient visual cues for safe VFR flight that is the predominant causal factor. The loss of visual cues has been described as flight into DVE and has many causes including bad weather, dust or snow obscuration, night flight without ground illumination, flight over calm seas, etc. Flight into DVE is in many cases a gradual process that the pilot may find hard to recognise until the visibility deteriorates to a near-critical level. Studies have shown that as the situation deteriorates so too does the average pilot's ability to deal with it. Gaining the ability to recognise the onset of degrading visibility is an airmanship skill that every pilot must work to develop. Obtaining this skill requires time, study, practice, learning from the experiences of others, dealing with the expectations of passengers and recognising one's own personality traits. The aim should be to develop a continual awareness and an ability to think ahead of the developing situation. The subject of helicopter flight in degraded visual conditions is covered thoroughly in AIC P 137/2019 (Helicopter flight in degraded visual conditions) which should be read in conjunction with this AIC.

1.4 Clearly, for the typical VFR-only pilot who is flying a helicopter neither certified nor equipped for flight in IMC, the best choice is to avoid flight into worsening visual conditions. To achieve this, the pilot has several options including returning to base, diverting, routeing around the weather or making a precautionary landing. This AIC considers the practicalities of when to make a helicopter precautionary landing and some of the issues and perceptions that surround doing so.

## 2 Aim

2.1 The aim of this AIC is to provide guidance on when to carry out a precautionary landing to avoid the threats inherent in continued flight into degraded visual conditions.

## 3 When is it Appropriate to Make a Precautionary Landing?

3.1 A precautionary landing can be defined as a landing made in order to prevent a perceived threat from seriously affecting the continued safety of the flight. This threat does not have to be imminently dangerous but can include the anticipation of a specific hazard arising, based on the pilot's pre-flight planning, knowledge, experience and reasonable evidence (e.g. worsening weather). Although a precautionary landing may be carried out at an airstrip or aerodrome, in many cases the landing site may have to be a suitable non-aerodrome site in close proximity to the track of the aircraft.

3.2 The helicopter has two unique properties that are well suited to making a precautionary landing: the ability to a hover at a defined point in space in a closely-controlled manner, and the ability to land at and take off from a confined area. With these properties, a helicopter can make safe use of a far greater variety and number of potential landing sites than can a fixed-wing aircraft. Therefore,

the helicopter pilot is, in many cases, far better placed to take effective action to avoid unanticipated hazards developing into life-threatening situations. **Making a precautionary landing should be regarded as a legitimate choice** available for use in the appropriate circumstances.

3.3 Despite these unique properties of the helicopter, analysis of fatal accidents resulting from VFR-certified helicopters continuing to fly into worsening visibility appears to show reluctance by the pilots to utilise these capabilities fully and in good time. It may well be that the pilots believed that since they did not need to use an aerodrome, the decision to take positive action could be delayed in the hope that conditions might improve. This is despite the fact that off-aerodrome landing site operations form an important part of helicopter flight training which provides the basic tools to carry out a precautionary landing. It is a fact that air accident reports continue to feature instances where an early decision to land would most likely have prevented the accident occurring at all.

3.4 Flight into degraded visual conditions ultimately presents two major threats to all pilots:

- Loss or degradation of visual references - leading to disorientation and Loss of Control;
- Loss of situational awareness - the pilot remains in control of the aircraft but has a false mental picture of the aircraft flight path and the position of the surrounding terrain - leading to controlled Flight into Terrain (CFIT).

Both of these threats are known killers. Loss of Control and CFIT continue to feature at the top of recorded fatal accident statistics.

## 4 The Legal Position: UK Aviation Legislation

4.1 The ability to carry out a precautionary landing does not provide helicopter pilots with the freedom to land wherever and whenever they like in a non-urgent situation. Nevertheless, carrying out a precautionary landing should be seen as a part of normal aviation practice when circumstances dictate. Many glider and balloon pilots routinely land away from an aerodrome and it is seen as a normal part of their operations. Making a precautionary landing in a helicopter should not be seen as a highly unusual or unlawful operation; it is a legitimate response to deteriorating conditions and may well be the safest option.

4.2 If, whilst making a precautionary landing, pilots can avoid congested areas then it is unlikely there would be any conflict with the Rules of the Air Regulations. It is accepted that the vast majority of flights needing to make a precautionary landing will be able to do so away from congested areas.

4.3 Even when there is a possibility of breaching the regulations, the Air Navigation Order 2016 (ANO) does make exceptions for certain circumstances where the safety of flight takes precedence. An example of this would be where an aircraft encounters DVE over a congested area and the pilot then decides his only option is to make a precautionary landing in an open space within that congested area. Although this action would normally be in breach Rule 5(1) of the UK Rules of the Air 2015 (prohibition of landing and taking off within a congested area), the ANO can provide for such a case through article 249(3) 'Rules of the Air' which states:

*'It is lawful for the Rules of the Air, or for any obligation in SERA the breach of which would otherwise be an offence under this Order, to be to be departed from to the extent necessary... (a) for avoiding immediate danger'.*

This is to allow for the immediate threat to be mitigated and could be considered a lawful departure from the rules in order to avoid an undesired aircraft state. In cases where ANO 2016 Article 249 is invoked, the pilot may afterwards be called upon to substantiate the nature of the 'immediate' danger but this does not mean he/she will have to do so in court. The commander of the aircraft must ensure that written details of the departure from the Rules of the Air are given to the CAA within 10 days (see ANO 2016 Article 249(5)) and this can be accomplished by submitting a Mandatory Occurrence Report (MOR) using the reporting portal which can be found at www.aviationreporting.eu or via the MOR reporting pages on the CAA website. The MOR scheme is fully described in CAP 1496 'ECCAIRS reporting portal UK user guidance'.

4.4 Making a precautionary landing is not an alternative to thorough pre-flight planning. Threat and Error Management and prudent airmanship are important elements in identifying anticipated weather threats. However, making an early decision about a precautionary landing when encountering the unanticipated threat of DVE could result in a far wider selection of landing sites being available and thus avoid any potential breach of the Rules of the Air Regulations.

## 5 Civil Law of Trespass

5.1 This AIC cannot cover all of the circumstances that may be encountered when making a precautionary landing. However, within the United Kingdom, land trespass is generally not regarded as a criminal offence unless it occurs with specific aggravating conditions. Scotland has a right of responsible access and an agreed code to assist this right, based on acting responsibly and avoiding damage.

5.2 Experience gained by the glider and balloon community demonstrates that precautionary landings do not automatically lead to civil actions from the landowner; such disputes, though rare, tend to be over damage caused by the aircraft, or its recovery, and possibly the behaviour of those involved. All parties have an obligation to obey the law and to act responsibly no matter where the dispute occurs. Pilot apprehension about unlikely civil consequences needs to be weighed proportionately against the very real dangers of continuing in rapidly degrading conditions. It is better to be faced with dealing with mundane issues on the ground, than to lose your life, or that of others, by not making the right decision to land in time.

## 6 Training and Information

6.1 The European pilot licensing regulation (Part-FCL) includes relevant training requirements for the Private Pilot's Licence (Helicopters): (PPL(H)) syllabus at Exercise 25(b) and (c). These exercises include the following teaching points and, if not previously taught, should now be considered by pilots during refresher training with a Flight Instructor (FI):

- actions in the event of encountering Degraded Visual Environment (DVE);
- decision to divert or conduct a precautionary landing;
- bad weather circuit and landing;

- appropriate procedures and choice of landing area;
- precautionary landings; and
- hazards of over-reliance on the use of GNSS (GPS) in the continuation of flight in DVE.

Pilots must also be trained in the techniques of threat and error management (TEM) to aid the management of anticipated and unanticipated weather-related threats.

6.2 Training organisations providing training for a Light Aircraft Pilot's Licence (Helicopters) (LAPL(H)) should consider providing training in these areas as well as they are not specifically mentioned in that syllabus.

6.3 Advice and guidance on conducting off-aerodrome landing operations together with Threat and Error Management, airmanship, decision-making and safety considerations has been developed by the European Safety Promotion Network (ESPN), which has replaced EHEST, and their pamphlets are available at www.easa.europa.eu/document-library/safety-promotion (apply a filter for 'Helicopters'). Additionally, the CAA publishes many Safety Sense Leaflets and these can be accessed at www.caa.co.uk/safetysense.

## 7 Summary

7.1 Precautionary landings are a legitimate and justifiable response to a flight safety hazard realistically perceived by the pilot and should be given full consideration when encountering deteriorating weather conditions where visual cues are becoming inadequate. Mitigations for the pilot include:

- Plan ahead thoroughly, including a realistic assessment of the weather and identify any anticipated threats, to avoid getting caught out and having to consider the need for a precautionary landing. Cancel the flight if appropriate.
- Before flight, brief your passengers that in the event of encountering the unanticipated threat of bad weather you may have to return to base, divert or carry out a precautionary landing. For VFR helicopter flights in the UK it is important, before flight, to manage the expectations of passengers, many of whom will only have experienced flying in large passenger jets on a scheduled service.

EHEST has produced two videos (one for pilots and one for passengers) that cover this subject and are free to use along with other EHEST safety material: www.easa.europa.eu/document-library/safety-promotion (apply a filter for 'Helicopters'). Ideally, passengers' clothing and footwear should reflect the reality that you may have to make an off-airport landing.

- Decide to carry out a precautionary landing earlier rather than later; this will give you a much wider selection of potential landing sites and avoids the stress of last-minute action.
- Practice precautionary off airfield landings with a flight instructor.

7.2 For the precautionary landing:

- Carry out the drills for an off-airport landing and secure the aircraft once you have landed. Try to avoid landing close to livestock.
- Ensure that you minimise damage and that you and your passengers respect the countryside code and the landowner's property.
- Contact the landowner whenever possible giving your details, aircraft registration, contact information, the reason you needed to land within their property and when and how you intend to leave. Treat the landowner with courtesy and respect and ensure that your passengers do the same. A good attitude and a co-operative manner will go a long way to establishing good relations.
- Report the occurrence to the CAA within 10 days via the MOR Scheme described in CAP 1496, if you believe there have been aggravating circumstances.
- Notify the local police as the landing may have been reported by a concerned third party.
- Notify the ATC unit you were communicating with in order they do not consider you missing.
- Notify your destination so that they do not start overdue action.

***Note:*** *A range of downloadable material on the following helicopter-specific subjects can be found at:* www.easa.europa.eu/document-library/safety-promotion *(apply a filter for 'Helicopters')*

DVD: Flight into DVE.

HE1 Safety Considerations

HE2 Airmanship

HE3 Off Airfield Landing Site Operations,

HE4 Decision Making

HE8 Principles of Threat and Error Management

HE13 Weather threats for VMC flights

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