No. 3654-P-00

SAFETY PROMOTION NOTICE

SUBJECT: GENERAL

Choosing the right landing site: an important decision

For the attention of

AIRCRAFT CONCERNED	Version(s)	
	Civil	Military
EC120	B	
AS350	B, BA, BB, B1, B2, B3, D	L1
AS550		A2, C2, C3, U2
AS355	E, F, F1, F2, N, NP	
AS555		AF, AN, SN, UF, UN, AP
EC130	B4, T2	
SA365 / AS365	C1, C2, C3, N, N1, N2, N3	F, Fs, Fi, K, K2
AS565		MA, MB, SA, SB, UB, MBe
SA366		GA
EC155	B, B1	
SA330	J	Ba, L, Jm, S1, Sm
SA341	G	B, C, D, E, F, H
SA342	J	L, L1, M, M1, Ma
ALOUETTE II	313B, 3130, 318B, 318C, 3180	
ALOUETTE III	316B, 316C, 3160, 319B	
LAMA	315B	
EC225	LP	
EC725		AP
AS332	C, C1, L, L1, L2	B, B1, F1, M, M1
AS532		A2, U2, AC, AL, SC, UE, UL
EC175	B	
H160	B	
EC339		KUH/Surion
BO105	C (C23, CB, CB-4, CB-5), D (DB, DBS, DB-4, DBS-4, DBS-5), S (CS, CBS, CBS-4, CBS-5), LS A-3	CBS-5 KLH, E-4
MBB-BK117	A-1, A-3, A-4, B-1, B-2, C-1, C-2, C-2e, D-2, D-2m, D-3, D-3m	D-2m, D-3m
EC135	T1, T2, T2+, T3, P1, P2, P2+, P3, EC635 T1, EC635 T2+, EC635 T3, EC635 P2+, EC635 P3, T3H, P3H, EC635 T3H, EC635 P3H	

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Airbus Helicopters would like to raise awareness of the importance of taking great care in the choice of landing site and approach. One of the significant benefits of helicopters is the ability to land in very remote places with scant infrastructure. The inherent consequence of this lack of standardized infrastructure is the need for pilots and ground support to make up for it with proper attention to detail and preparation.

What are the risks?

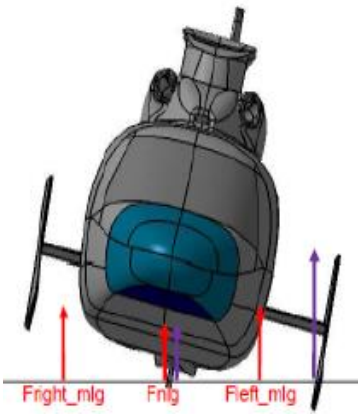
Risks related to the landing area:

- In ground effect hover, the tangential wind on the ground peaks at a distance equivalent to 0.5 to 1 rotor diameter from the aircraft. It then decreases; the value is halved when 2 rotor diameters away from the aircraft and is generally inversely proportional to the distance to the main rotor. Large aircraft can have up to 50% higher tangential wind speed than smaller rotorcraft.
  - ➢ Loose items will fly, this may cause damage and injuries.

- Surfaces that are too small may provide insufficient clearance for landing and take-off. While the pilot will have a clear mental picture of these obstacles on the way in, they might be less evident when the time comes to leave.
  - ➢ This may lead to main rotor or tail rotor impacts.

- If a landing surface is not uniformly load-bearing enough to bear the aircraft's weight, this may cause the aircraft to sink slightly or one side to sink more than the other.
  - ➢ This may lead to undercarriage and horizontal stabilizer damage as well as injuries to people on the ground.

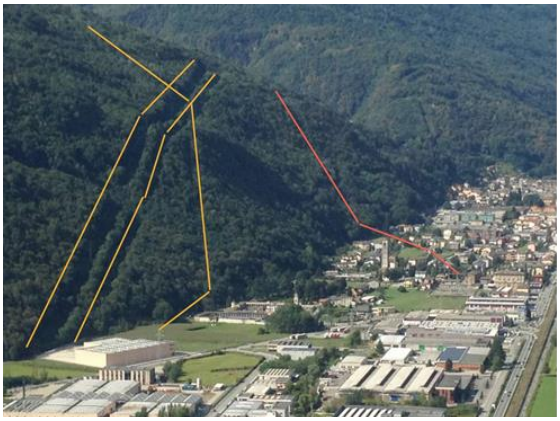
View from front ->
<- View from aft



- Loose dust, sand, or snow on the landing site can be raised by wind or the aircraft's downwash.
  - ➢ This may lead to loss of external visibility, known as brownout/whiteout.

Risks related to the approach vector:
- Cables and wires on the approach path may not be indicated on maps or may be difficult to spot due to poor visual cues.
  - ➢ This may lead to a wire strike on the way in or later, on the way out.
- The same applies to the landing-reject vector. Ensure it is as free as the approach.

Not all wires are easily detected from the air



Picture made available courtesy of ESPN-R

Recommendations for pilots

Landing is a decision:
- You must abort the landing if the site is not appropriate.
- A risk evaluation approach is recommended and will aim to limit exposure duration.
- Stay objective and analytic, and do your best to keep emotions in check to avoid unnecessary risk-taking.

It is recommended to use a structured approach and follow a predetermined checklist with at least the following items, as you build your landing case.

Pre-flight preparation

It is recommended to perform a ground visit of the landing site prior to the flight if it is not an airport or similarly managed facility. Some organizations keep an updated record of such assessments with photos and comments.

It is recommended to update your navigation/obstacle database prior to flight.

It is recommended to check the power margin for the landing area prior to the flight if you can (altitude density, expected mass upon arrival).

Pre-landing checklist

Make sure to turn off your search lights and trackers prior to touching down to avoid fire hazards and third-party injuries.
Conversely, turn on all other external lights to illuminate the aircraft and reduce the risk for third parties on the ground.

Obstacles

Always perform a high and low reconnaissance. Be aware that depending on the relative position to the sun, some obstacles will be less conspicuous (cables), so keep scanning the whole area during the reconnaissance to build a mental picture from various angles.
Linear clearings and poles are visible cues that can help identify the position of wires and cables (see illustration in the risk chapter).

Landing spot

The general recommendation for the size of a landing area is a minimum of twice the diameter of the main rotor.
Pay attention to the nature of the ground: as level as possible, uniformly load bearing enough, dry, and low vegetation that does not hide obstructions.
If you are landing on private property, owner authorization & notification of authorities are required under many regulations (with some exceptions for EMS).
As a general rule, roads are poor choices for landing spots as there is too often a high density of nearby poles, signs, traffic, and other obstacles that may be difficult to see. Open field sites are preferable.
Bear in mind that steep approaches can increase exposure to Vortex Ring State.

Communication

For parapublic activities, communication with ground support prior to the flight to present your mode of operation, needs, and expectations can significantly improve safety margins and improve expediency. This can be supported by the dispatch community and is renewed yearly. Ground support can be trained to learn marshalling signs; the emergency ones can be found in our elearning.

Prior to the landing phase, brief the crew on how they can support obstacle identification. Communication must be detailed and explicit. Never assume.
In a CRM-organized mission, the pilot should precisely describe the spot selected for landing and the position of the landed helicopter relative to the topographic features of the spot.
If available, establish a radio connection with a ground crew (it is recommended to have one, depending on the mission type of course).

Private pilots should contact someone at the landing site and inquire about the weather in the last 24 hours, as well as the nature of the ground prior to landing.

Aerology

Assess wind directions and possible turbulences due the topography in your approach.
Keep in mind that tail wind can increase exposure to Vortex Ring State or Unanticipated Yaw.

Power Management

In no-wind conditions, OGE (out of ground effect) hover power required is significantly higher than the IGE (in ground effect) hover – landing - power need. If in doubt of your available margin, this is an additional indication that may support your decision-making.

Airbus Helicopters helicopters are equipped with advanced power management systems (such as the FLI) that help assess the remaining power margins.

If you are flying twin engine, opt for an approach that allows for safe single-engine reject.
If you are flying single engine or do not have sufficient OEI performance, limit the exposure time in your landing and take-off profiles.

Recommendations for ground support

Choice of landing area

The general recommendation for the size of a landing area is a minimum of twice the diameter of the main rotor. Consult our range of Ground Rescue Booklets (PDF or elearning) or ask the pilot.
A helicopter does not normally land vertically; there is usually an approach with a slope. The aircraft will need an obstacle-free approach path to the landing zone. Take into account obstacle height (trees, buildings) & power lines when suggesting a site & approach path to the pilots.

General tidying/removing of loose objects

Loose objects may be sent flying by the main rotor downwash. It is highly recommended to clean the landing area and remove all loose objects as they may injure people on the ground.
This includes items like traffic cones and hats.

Crowd management

Remove people and animals from the landing zone.
Ensure no one approaches the aircraft without the pilot's prior approval, including ground support. It is best to designate one person who will do this.

Lighting of the landing surface

Do not shine lights toward the aircraft; always point them at the ground.
Use car lights or public lights to light the landing zone.
Flares may be blown out and pose a fire risk.

Communication

Gather information on local conditions to be relayed to the pilot.
Never assume you know what information the pilot will or will not need.
Do not hesitate to volunteer information on local items, even as far as a mile away, or the previous day's conditions.

Ground forces can train to learn marshalling signs; the emergency ones can be found in our elearning.

Conclusion

Landing is a decision:
- If in doubt, don't!
- You must abort the landing if the site is not appropriate.
- A risk evaluation approach is recommended and will aim to limit exposure duration.
- Stay objective and analytic, and do your best to keep emotions in check to avoid unnecessary risk-taking.

Further reading

Airbus Helicopters strongly recommends the following documents:

EHEST Leaflet HE 3 Helicopter Off Airfield Landing Sites Operations

EHEST Mission Request Vade Mecum Toolkit

Boston MedFlight Landing Zone Training