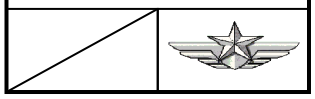
No. 3640-P-00

SAFETY PROMOTION NOTICE

SUBJECT: GENERAL

Intentional deviation from normal flight maneuvers

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 remind pilots of the risks associated with the deviation from normal flight maneuvers. This covers maneuvers that, in retrospect, are described as “risky”, or aerobatics.

What we can learn from past events

Lessons learnt from past accidents or incidents involving such maneuvers show that a recurring trait is a lack of preparation. “Spur of the moment” or improvised maneuvers without preparation are frequently quoted as contributing factors.
Another recurring feature of such maneuvers is the intentional deviation from procedures or regulations.

Here are some examples to highlight this issue:
At the end of a flight, the pilot of an EMS company told a nurse that he would show her a maneuver used to “hunt coyotes”. The aircraft hit the ground with high speed. The nurse was ejected from the aircraft and was the sole survivor.
A military pilot decided to perform an aerobatic maneuver over a lake, but the improvised display was initiated with too low altitude and the maneuver resulted in hitting the surface of the lake.
The day before the accident, a customer was there when the helicopter took off from the parking lot and he saw the helicopter performing a 360 ° spiral before leaving. Very impressed by this maneuver, he called the helicopter company to know more about it as he would like to have it on video. The pilot told him that he would be there the day after and replicate the maneuver. The accident happened the day after, when the maneuver was attempted.

Main risks identified

Flying at low height

Events involving unprepared maneuvers that lead to either Loss of control (LOC-I) or Controlled Flight into Terrain (CFIT) are frequently associated with flying at low height. Low flying significantly increases the risk level of:

- Wire strike
- Collision with ground & obstacles
- Third party injuries or fatalities
- Bird strike
- Insufficient height margin to recover any unforeseen issue.

Flying at low height (when not specifically mandated by the mission) also creates a risk for the image and reputation of your company by antagonizing or scaring third parties on the ground due to noise pollution.

Normalizing unusual behavior

Responsible pilots should prevent casual deviations from normal flight maneuvers. Observers lacking background information or appropriate qualification might be tempted to imitate such maneuvers without the extensive preparation they require.

Breaching regulations

There is also the risk of breaching regulations (minimum height requirements, rules of the air, airspace classification, etc.) and, with the increasing omnipresence of social media, the risk that this will be made public and investigated. Abide by the regulations for your own protection.

Overloading the aircraft

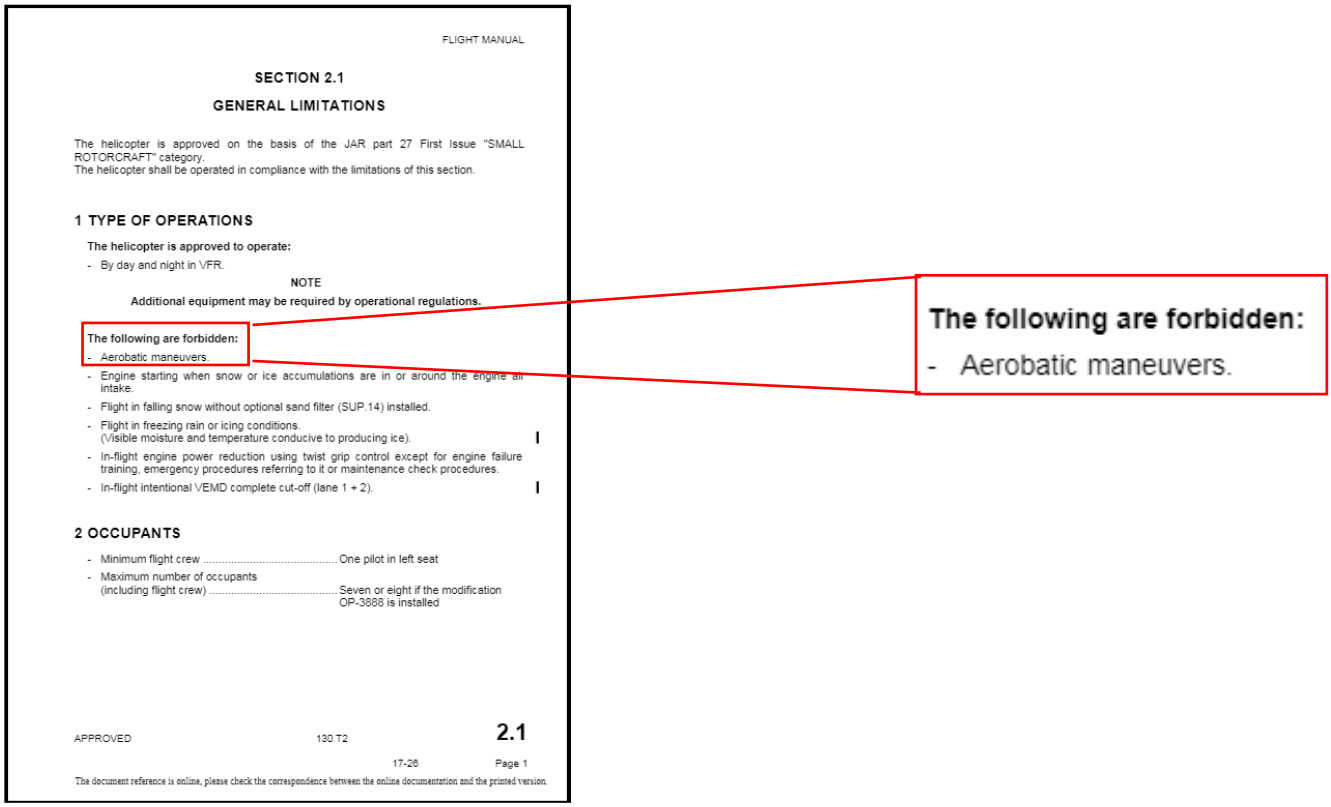
Among the risks associated with deviations from normal maneuvers, there is the inherent risk of inadvertently exceeding the certified flight envelope. As a consequence, some components will bear loads that they were not designed to withstand. This puts the aircraft and passengers at risk during the maneuver, but also for all following flights if it is not reported and properly investigated.

Defining acrobatic flight

Acrobatic flight is introduced in ICAO Annex 2, chapter 1:

> *Acrobatic flight.* Manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

This requirement has been introduced in the Flight Manual limitations for most aircraft:



FLIGHT MANUAL

SECTION 2.1

GENERAL LIMITATIONS

The helicopter is approved on the basis of the JAR part 27 First Issue "SMALL ROTORCRAFT" category.
The helicopter shall be operated in compliance with the limitations of this section.

1 TYPE OF OPERATIONS

The helicopter is approved to operate:

- By day and night in VFR.

NOTE

Additional equipment may be required by operational regulations.

The following are forbidden:

- Aerobatic maneuvers.
- Engine starting when snow or ice accumulations are in or around the engine air intake.
- Flight in falling snow without optional sand filter (SUP.14) installed.
- Flight in freezing rain or icing conditions. (Visible moisture and temperature conducive to producing ice).
- In-flight engine power reduction using twist grip control except for engine failure training, emergency procedures referring to it or maintenance check procedures.
- In-flight intentional VEMD complete cut-off (lane 1 + 2).

2 OCCUPANTS

- Minimum flight crew ..... One pilot in left seat
- Maximum number of occupants (including flight crew) ..... Seven or eight if the modification OP-3888 is installed

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The document reference is online, please check the correspondence between the online documentation and the printed version.

The following are forbidden:
- Aerobatic maneuvers.

Monitoring the attitude of the aircraft is not sufficient to determine the actual loads on the aircraft. As a consequence, putting limits on attitude is not adequate to prevent the occurrence of excessive loads on the aircraft.

Apart from test aircraft, few are equipped with the instrumentation required to effectively track accelerations and loads. Nor would this be sufficient without the training necessary to effectively fly with these added data.

Also, defining hard limits would require taking into account many factors linked to specific flight maneuvers, aircraft type, aircraft loading, pilot skills, and is only practical for dedicated cases. This is why there are no generic quantified attitude limits to define acrobatic flight in the limitations section of the FLM.

Recommendations

Airbus Helicopters recommends that you focus on well prepared flights, avoiding unprepared maneuvers. In specific cases, there can be a need to deviate from normal flight maneuvers. This is something that should normally not be decided in-flight.

Prior to the flight, the intended maneuvers should be well planned and briefed:

1/ Ensure that there is a valid reason to do so.
2/ Check for compliance with the air regulations and get your organization's approval for the intended flight maneuvers.
3/ Ensure the coherence of the maneuver with the aircraft ability, as well as the pilot's skills, mental and physiological condition.
4/ If the planned maneuver is performed for the first time by the pilot or if the pilot is not familiar with the maneuver, ensure proper training in a risk-free environment (higher altitude, gradual approach, monitoring by an instructor, etc.).
5/ Proper monitoring of the flight is recommended as well as robust debriefing.

Airbus Helicopters recommends operators to set up their own operational limitations for their specific maneuvers. This will support the setup of HFDM programs that will automatically monitor the compliance of performed maneuvers with (internally) approved operational parameters.

This aims to ensure the safety of aircraft, flight crews, passengers and third parties on the ground.

As a reminder, please remember this extract of ICAO Annex 2:

3.1.1 Negligent or reckless operation of aircraft

An aircraft shall not be operated in a negligent or reckless manner so as to endanger life or property of others.

For more information

For other materials on this topic, please also consult the EASA publication on Avoiding Risky Manoeuvres.