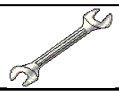
No. 2302-I-00

Information Notice

SUBJECT: GENERAL

Protection and use of helicopters in cold weather and in damp conditions

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

The purpose of revision 2 of this Information Notice is to remind you of the recommendations related to flight in cold and damp weather conditions. It also informs you of a recent case of engine flameout that occurred in flight shortly after takeoff, following a ground run-up in snowy conditions.

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The experience gained on our helicopters has revealed some cases of engine flameout or damage occurring shortly after takeoff. The helicopters had previously been subject to cold weather in snowy or rainy conditions, and parked in the open.

In this context, Airbus Helicopters has recently been informed of a case of engine flameout that occurred in flight shortly after takeoff. It was possible to restart the engine in flight and the helicopter landed without further incident.
This event occurred in snowy conditions and after a ground run-up with spinning rotor in falling snow. The waiting time on the ground before takeoff was necessary to clear the snow from the airfield runway. Analysis showed no anomaly on the helicopter that could explain the event. The most probable scenario is that the engine flameout was caused by the ingestion of a significant amount of snow that had accumulated on the air intakes during the waiting time.

A turbo-shaft engine has a good rainwater or falling-snow absorption capacity in continuous operation. On the other hand, the engine is **sensitive to a "sudden quantity" of water, snow or ice**, because this quantity (even limited) corresponds to a very high instantaneous concentration exceeding its absorption capacities.
This can occur due to snow and ice accumulating in the engine air intakes and plenums when the aircraft is on the ground with the engines stopped or when the engine is at a low power rating for an extended period.

Consequently, Airbus Helicopters considers it useful to remind customers of the basic precautions to be taken in cold weather (temperature close to zero or below zero degrees), as indicated below.

Airbus Helicopters is periodically reissuing this Information Notice to draw your attention to the following recommendations:

1. Precautions for parking in the open

After arriving on a parking area in cold weather in falling snow or rain, it is recommended to install **the air intake blank (protective tarp) rapidly following engine shutdown**. The exhaust pipe blank can be installed subsequently, as soon as the exhaust pipe temperature is acceptable.

2. Pre-flight precautions

The quick installation of the blanks is a basic precaution, but their use does not guarantee that no ice will accumulate in the air intake (possible phenomenon of water seepage in the air intake due to rain or molten snow). Consequently, if the helicopter has been parked in the open in cold weather in falling snow or rain, and whether it is equipped with specific engine air intake snow protection or not (snow filter or sand filter or multipurpose air intake), **the following steps must be taken:**

a. Carefully remove the snow or ice from the helicopter, in particular around the air intakes (especially from the engine air intake).

b. Remove the engine air intake blank then remove any snow and ice that may have accumulated on the air intake and the air intake screen or the filter system (if the helicopter is thus equipped).

c. Check the inside of the engine air supply system; it may be necessary to remove a screen or filter or cowling (according to the type of helicopter). This check should include the internal surfaces of the air intake, the area located in front of and around the air intake. Any accumulation of snow or ice must be removed.

d. Before closing or reinstalling the engine air supply system, perform a complete check using a torch (in case of poor light conditions or back light) and, if necessary, by looking from different angles to have a complete view of the engine air intake system.

e. Check that there is no snow or ice on the air vents, the static ports, the drains and scuppers.
Any snow or ice must be removed.

f. It is preferable to use a hot-air blower or an appropriate de-icing fluid to remove ice or snow. Removing ice or snow by chipping or scraping can bring residual amounts of ice or snow inside the air intake. In freezing temperature, pay particular attention to sheet ice located on the lower part or in front of the air intake.
It may be necessary to warm this area to remove the ice. A hot air blower can be used. In this case, all the water from thawing must be wiped off thoroughly to prevent an accumulation of water and the risk of subsequent refreezing.

g. In particular, there must be no accumulation of water in the engine air supply system (screen or filter) which could freeze again subsequently.

h. If the helicopter is equipped with an anti-icing system of type STC (Supplemental Type Certificate), the maintenance recommended by the manufacturer and the recommended pre-flight steps in cold weather and damp conditions must in all cases be complied with.
Airbus Helicopters would like to inform you of the risks which may be caused by the installation of additional equipment installed under STC and reminds you of the recommendations edited in Service Letter 1882-00-08, notably the impact on flight safety of the STCs not validated by Airbus Helicopters.

These operations must be performed **at the last moment before engine starting**.

3. Additional precautions before takeoff

If the helicopter is not equipped with specific engine air intake snow protection (no snow filter or sand filter or multipurpose air intake), **the engine air intake must be checked again before takeoff** in the following cases:

a. In light or moderate falling snow or sleet conditions, if the waiting or taxiing phase is long (as an indication: more than 20 minutes for a Super Puma).

b. **In blown or heavy-falling snow or sleet conditions**, regardless of the taxiing or waiting phase. Heavy snowfall conditions are characterized by a horizontal visibility of less than 400 meters. In these conditions, the takeoff must be performed quickly after checking the engine air supply system and very quickly after starting the engine(s), taking into account of course the minimum engine or MGB oil temperature limits possibly specified in the Flight Manual for the helicopter concerned.

4. Precautions in flight

Even after complying with the precautionary measures above, the crew must give their full attention to the in-flight operating procedures in icing or snowy atmospheric conditions, as reminded below:

a. Comply with the VFR flight limitations, sufficient visibility for visual flight rules (VMC).

b. Comply with the Flight Manual regarding the restrictions or flight limitations in icing conditions or in falling snow. Some helicopters are equipped with specific options enabling you to waive compliance with these restrictions or limitations.

c. If the helicopter is equipped with multipurpose air intakes, and for flight in icing conditions or in snow, the bullets must be kept closed until the engines are fully shut down. This is to prevent flameout or damage to the engine.

d. Moreover, certain helicopters can fly in known icing conditions if they are equipped with an anti-icing system. In such a case, the pilot must switch on the anti-icing system any time when operating in visible moisture, such as fog, rain or clouds, when the temperature is below 5 degrees Celsius.
(Note: The use of anti-icing or de-icing systems can lead to a fuel consumption increase).

e. From the cockpit, the effects of in-flight icing can be apparent:
- Visual cues, along with ice detector indications, inform you of icing conditions.
- Visible ice on exterior components, such as mirrors, wipers, and antennas, give clues as to what kind of ice is present and the rate of accumulation.
- At night, pilots have to be aware of other indications in addition to those obvious during the day, such as changes in vibrations in flight due to blades shedding ice; reduced stability on the pitch and yaw axis; and torque increases to maintain airspeed. A quick check with a landing light usually enables to identify the position of the helicopter in the cloud formation.
- In case of vertical-developed cumulus clouds, the least favorable position is skimming the tops, where a greater amount of moisture is present, and very rapid rates of ice accumulation can occur.
- With all these factors in mind, pilots must be aware of possible degraded overall performance, especially in single-engine rating or with both engines shut down. Performance in autorotation may be affected by ice. Increased weight leads to higher rates of descent and unstable rotor RPM. Single-engine performance can be affected by increased weight, and single-engine climb performance can be affected by operating de-icing systems, the rate of climb decreasing in some cases from 700 ft/min to 200 ft/min.