

HELI LAUSANNE



HB-ZCA

**EC 120 B CHECKLIST
EMERGENCY CHECKLIST
LIMITATIONS
PERFORMANCES
PREFLIGHT CHECKLIST
ALERT CHECKLISTE
SECURITY AROUND
W&B COMPUTATION SAMPLES
Master-MEL – refer to Log Map**

The pilot is responsible for correct operation of the helicopter according the AFM. This summary is provided only as additional material for preflight preparation. Heli-Lausanne declines all responsibility in case of non respect of any official manufacturer limitations(AFM).

ALLWAYS REFER TO AFM FOR MANUFACTURER PROCEDURES

EC 120 B - NORMAL PROCEDURES / CHECKLISTS**Engine Prestart**

Flight time counter.....CHECKED
 Seats and control pedals.....ADJUSTED
 Seat belts.....FASTENED
 Heater.....OFF
 Fuel shut-off lever..... FORWARD, LOCKWIRED
 Rotorbrake.....FORWARD
 Battery and Generator.....ON
 Light test (warning/caution lights).....PERFORM
 Horn.....ON
 Engine fire test (light +gong).....PERFORM
 HornOFF

Warning panel remaining lights (battery power)

GENE **PITOT** **ENG P** **FUEL P** **HORN** **MGB P** **TWT GRIP** **HYDR**
 (EPU power, same lights) + **BATT**

→ Twist grip.....CHECK FULL TRAVEL and GROUND IDLE STOP
 VEMD.....ENGINE PAGE DISPLAYED
 Control pedals.....CHECK TRAVEL THEN NEUTRAL POSITION
 Collective pitch.....LOCKED
 Twist grip.....OFF position
 Hydraulic switch (on collective lever).....ON

→ **BATT. VOLTAGE** **Min 24 volts**

Engine Start

T4 (on VEMD, digital).....**CHECK below 150°C**
 Fuel pump (30sec).....ON

FUEL P.....OUT
 Anti collision lightON

→ After 30" Twist grip **START POSITION / 1mm before WHITEMARK**
 Starter.....DEPRESS

Twist grip.....**MONITOR T4 (MAX 700 °C)**

Starter..... = 50%Ng RELEASE
 VEMD FLI display.....Ng > 60%

ENG P **HYDR** **MGB P** – lights.....GO OUT

Radios / TRP / MT.....ON

Pitot.....ON

Hydraulic Accumulator Test

Collective pitch LOCKED
Hydraulic LACU pushbutton ON
HYDR light on warning panel COMES ON
Move cyclic 3 times along both axes separately 10% of total travel (2.5 cm). Check hydraulic assistance for absence of control load.
Hydraulic LACU pushbutton OFF
HYDR light on warning panel GOES OUT
If not locked, the collective pitch will increase when HYDR switch is in OFF position.

Hydraulic shut-off test

Hydraulic switch on collective lever OFF
HYDR light on warning panel COMES ON
Control loads are felt immediately.
Hydraulic switch ON
HYDR light on warning panel GOES OUT IMMEDIATELY

Twist grip open to (maintain $T_q < 40\%$) FLIGHT POSITION
TWT GRIP light (when twist grip in flight position) OUT
→ Fuel pump OFF
Attitude, Horizon (2) CAGED
Altimeter SET
→ HORN ON

Check before Departure

Doors..... LOCKED
Collective and cyclic friction..... AS REQUIRED
Warning lights..... ALL LIGHTS OUT
V/A switch..... SELECT GEN
Voltage and current. CHECK
All necessary systems (Radios, GPS, lights)..... ON, TESTED

Landing light..... AS REQUIRED

Check power pedal position..... 3-4 cm RIGHT

Adjust collective and cyclic friction locks so that friction forces
are felt by the pilot when moving the flight controls.

Check in Ground Effect

RRPM..... UPPER GREEN
Power FLI..... IN LIMITS
Takeoff axis..... CLEAR
Wind..... CHECK

Climb Check

Speed ADJUSTED
Vertical speed..... POSITIVE

Check for Approach

Twist grip..... FULL OPEN
RRPM..... GREEN ARC
All Warning light..... OFF
Engine Page FLI..... IN LIMITS
Fuel Quantity..... CHECK
Heater..... OFF

Final Check

Speed..... 30 KT
Vertical speed..... < 500 FT/MIN
Decision..... LAND/GO AROUND

Engine Shut Down

Cyclic stick..... NEUTRAL
Collective pitch..... LOCKED
Cyclic stick friction..... ON
Horn, Pitot, landing light..... OFF
Twist grip..... GROUND IDLE
Radios, TRP, MT..... SWITCH OFF
Twist grip (after 45")..... SHUT OFF POSITION

→ **VEMD**..... CHECK FLIGHT REPORT

Anti collision light OFF
Battery..... OFF
Generator...(only overnight,stop electrical consumption)..... ON

→ **VEMD**

FLIGHT NUMBER **REPORT ON TECHLOG**
NG & NF CYCLES **REPORT ON TECHLOG**

FAILURES **CHECK & REPORT AS REQUIRED**
OVERLIMITS **CHECK & REPORT AS REQUIRED**

POWERCHECK **NOTE IF PERFORMED DURING FLIGHT**

OVERNIGHT

BATTERY	DISCONNECT (rear compartment)
COVERS	AS REQUIRED
DOORS	LOCKED
WIND > 50 KTS	HELICOPTER MUST BE TIED DOWN
SLIPPERY GROUND	HELICOPTER MUST BE TIED DOWN

EC 120 B - EMERGENCY PROCEDURES

AUDIO WARNINGS

1. Gong – Red warning light on caution panel CWP
2. Continuous tone – NR below 370 rpm
– When take off limitations are exceeded
3. Intermittent tone – NR above 420 rpm

ENGINE FLAME OUT

1. Collective reduce
2. Set IAS to Vy 65 kts
3. Twist grip shut off detent
4. Manoeuvre aircraft into wind
5. At height 70 ft cyclic flare
6. At height 20 ft collective increase and
7. Cyclic forward to adopt landing attitude
8. Pedals adjust heading
9. Collective increase to cushion touch-down

ENGINE RELIGHTING

1. Ng less than 10%
2. Try normal starting procedure
3. At least 1000 ft are necessary

ENGINE GOVERNOR FAILURE

A. NR drop

1. Collective reduce to maintain NR in green arc
2. Twist grip check in flight detent
3. If necessary apply autorotation

B. NR increase

1. Collective increase to maintain NR in green arc
2. Twist grip slightly reduce
3. Land as soon as possible
4. Initial a shallow approach
5. Set torque at around 30%

SMOKE IN THE CABIN

A: Source of smoke identified

1. Corresponding system OFF
2. Ventilate the cabin

B: Source of smoke not identified

1. Heating/demisting OFF
2. Battery and generator OFF
3. Ventilate the cabin
4. All consumers OFF
5. Battery ON
6. Generator ON
7. All consumers one by one ON
8. Land as soon as practical

VERMD FAILURES

A: One VERMD screen failure

1. Read all information on other screen
2. Using scroll on display or collective

B: Both VEMD screen failure

1. Check battery and generator ON
2. Set IAS to max 100 kts (-2 kts/1000 ft)
3. Carry out a no hover landing

C: Caution message on VEMD

1. Lane 1 or 2 failed
Press OFF 1 (or 2)
2. VEH parameter out of range / over limit
3. ENG parameter out of range / over limit
4. Crosstalk failed
Press OFF 1 (or 2)
5. BRT control failed
6. FLI failed
Check parameter
7. GEN parameter out of range / over limit
8. BAT parameter out of range / over limit
9. BAT T
10. GPS not available
11. Over limit detected

ABNORMAL NR/NF INDICATION

A: NR Indicator Failure

1. Maintain torque > 20%
2. Land as soon as practical

B: NF Indicator Failure

1. Avoid abrupt collective reduction
2. Continuous flight

C: Failure of NR an NF indication

1. FLI replaced by 3 data display
2. Continuous flight

ABNORMAL ENGINE PARAMETER INDICATION

A: Engine oil temperature over 110°C

1. Set IAS to Vy 65 kts
2. Temperature remains – land as soon as possible
3. Temperature reduces – land as soon as practical

B: Loss of OAT, Ng, Tq or T4 parameter

1. FLI replaced by 3 data display
2. Continuous flight

C: OAT indicator failure

1. ? Ng indicator on VEMD only yellow arc
2. Maximum takeoff power MTOP Ng = 100%
3. Maximum continuous power MCP Ng = 98.5%

D: Ng indicator failure

1. OAT > 10°C T4 limited to 760°C
2. OAT < 10°C T4 limited to 750°C

NOTE: Only starting limitations are displayed

E: Torque meter failure

1. Respect maximum Ng given on AFM:
2. Example: 2000 ft 15°C MCP Ng = 96.5%
4000 ft 05°C MCP Ng = 95.5%

F: T4 indicator failure

1. Respect Ng and Tq limitations
2. Do not try to start the engine

FLIGHT CONTROL HARDOVER OR SERVOJAM

1. Attitude maintain
2. HYD switch OFF on collective
3. Set IAS to Vy 65 kts
4. Land as soon as possible

ROTOR BRAKE INOPERATIVE

1. Land aircraft into wind
2. Cyclic stick slightly forward
3. Remain on the controls until rotor stops

RED LIGHTS

ENG FIRE

1. Collectiv reduce
2. Set IAS to Vy 65 kts
3. Twist grip OFF
4. Emergency shut-off handles AFT
5. Autorotation

ENG P

1. Reduce power
2. Oil pressure check
3. Low oil pressure - Autorotation
4. Normal oil pressure - Land as soon as practical

TWT GRIP

1. Increase twist grip to FLIGHT position

MGB P

1. Reduce power
2. Tq set below 45%
3. Land as soon as possible (max 30 min)

HYD

1. Collectiv reduce
2. Set IAS to Vy 65 kts
3. HYD switch OFF
4. Land as soon possible
5. Perform a shallow approach with normal landing

BATT TEMP

1. Battery OFF
2. Generator Voltage check
3. Voltage correct – Land as soon as possible

AMBER LIGHTS

ENG CHIP

1. Metal particles in engine oil circuit
2. Land as soon as possible

GB CHIP

1. Metal particles in MGB or TGB oil circuit
2. Land as soon as possible

MGB TEMP

1. Reduce power
2. Set IAS to Vy 65 kts
3. Light remain ON – land as soon as possible

BATT

1. Battery check ON
2. ELECT RESET actuate
3. Land as soon as practical

GENE

1. GENE check ON
2. ELECT RESET actuate
3. Unnecessary equipments OFF
4. Land as soon as practical
5. If battery fails, VEMD will go out and only analogue NR information remain
6. Before total battery failure, NR audio alarm will come on ($U < 18V$)

BATT FUSE

1. Battery fuse blown
2. Battery is offline
3. Land as soon as practical

FUEL

1. Fuel quantity < 30 kg
2. 15 min of flight at MCP
3. Avoid maintaining sideslip over 15°
4. Land as soon as possible

FUEL P

1. Reduce power
2. Fuel pump ON
3. Be prepared in case of an engine flame-out
4. Land as soon as possible
5. Perform a minimum power approach an landing

FUEL FILT

1. Reduce power
2. Light remain ON – Land as soon as possible
3. Light OFF - Land as soon as practical
4. If Ng oscillations occur – Land immediately

PITOT 1.

PITOT check ON

HORN 1.

HORN check ON

P2 TEMP

1. Cabin outlet nozzles check that air flows
2. Heating control close

EC 120 B – GENERAL LIMITATIONS

(summary from AFM)

> MTO WEIGHT	1715 KILOS 1800 KILOS WHEN EXTERNAL WEIGHT
USE CHART FOR WEIGHT AND BALANCE CALCULATIONS	

VNE POWER ON	150 KT LESS 3 KT/1000 FT	SLIDING DOOR OPEN	130 KT
VNE POWER OFF	120 KT LESS 3 KT/1000 FT	WHILE OPERATING SLIDING DOOR	80 KT

PRESSURE ALTITUDE	20000FT
TEMPERATURE	MIN -25° C MAX ISA + 30° C, (LIMITED TO + 45°C)
LANDING AREA / SLOPE (CHECK WITH HORIZON INSTRUMENT)	10 ° AFT = NOSE UP 8° SIDE = SIDEWAYS 6° FWD = NOSE DOWN

ENGINE LIMITATIONS

- > STARTER MUST NOT BE ENERGIZED MORE THAN 3 TIMES - AFTER 3RD ATTEMPT WAIT 30 MINUTES

NOTE:

- > T4 BEFORE STARTING NOT > 200° AND BATTERY VOLTAGE > 15 VOLT.
> IF T4 > 150° - WAIT FOR NG 10% AND THEN ACCELERATE

- > NF LIMITATION: 365 RPM MINIMUM – 422 RPM MAXIMUM
(MAX 447 RPM TRANSIENT LIMIT DURING 5 S)
(365 UP TO 373 IS CAUTION RANGE DURING 5 S)
NORMAL OPERATING RANGE: 373 TO 422 RPM

NG LIMITATION: NOTE: 100% NG CORRESPONDS TO 54117 RPM

VEHICLE LIMITATIONS

MAIN ROTOR LIMITATION: (nominal speed: 406 rpm)

340 rpm to 390 rpm	390 rpm to 415 rpm	415 rpm to 447 rpm
Caution range	Normal Operating	Caution range
Low NR 370	aural warnings	High NR 420
340 rpm mini to 447 rpm maxi when power off		

C 120 B – FLI LIMITATIONS (FIRST INSTRUMENT LIMITATION)

(summary from AFM)

MAX CONTINUOUS RATING	9.6
TAKEOFF POWER RANGE	9.6 TO 10 MAX
MAX TRANSIENT RATING	10.8 MAX 5 S

NOTE: USE OF P2 AIR BLEED ABOVE MAX CONTINUOUS RATING (NG OR T4)**TORQUE**

MAX CONTINUOUS RATING	97 %
TAKEOFF RANGE (WITH IAS < VY / 65 KT)	97 % TO 103%
MAX TRANSIENT RATING (5 S)	110 %

T 4

MAX CONTINUOUS TRANSIENT (5S)	STARTING	800°C	FLIGHT	830°C	MAX CONTINUOUS TRANSIENT (5 SEC)
		870°C		900°C	

OIL TEMPERATURE

CAUTION RANGE	- 10°C TO +10C
MAX TEMPERATURE	110°C
MINIMUM TEMPERATURE BEFORE POWER APPLICATION	0°C (OIL 3CST) OR 10°C (OIL 5CST)

GENERATOR LOAD LIMITATIONS

MAX CONTINUOUS	150 A
MAX TRANSIENT	240 A (DURING 2 MIN.)

BATTERY TEMPERATURE LIMITATION

CAUTION TEMPERATURE	60°C
MAXIMUM TEMPERATURE	75°C

CABINE LOAD LIMITATION

ON FLOOR, DISTRIBUTED LOAD MAXI	441 KG (300 KG/M2) MAX
ACCORDING WEIGHT AND BALANCE LIMITATIONS	

BAGGAGE COMPARTEMENT LOAD LIMITATION

DISTRIBUTED LOAD MAXI	300 KG/M2 MAX
ACCORDING WEIGHT AND BALANCE LIMITATIONS	

PERFORMANCES HOGE

EC 120 B														
Leistungswerte HOGE, HIGE, takeoff power, no wind, heater demister off														
Achtung:		max. Abfluggewicht:		- ohne Aussenlast		1715 kg		- mit Aussenlast		1800 kg				
P. Alt.	isa	isa -20	HOGE	isa -10	HIGE	isa -10	HIGE	isa	HIGE	isa + 10	HIGE	isa + 10	HOGE	isa + 20
0 ft +15		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
1000 ft +13		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
2000 ft +11		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
3000 ft + 9		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
4000 ft + 7		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
5000 ft + 5		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
6000 ft + 3		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
7000 ft + 1		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
8000 ft - 1		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
9000 ft - 3		1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg	1715 kg
10000 ft - 5		1715 kg	1715 kg	1690 kg	1715 kg	1690 kg	1715 kg	1610 kg	1680 kg	1510 kg	1580 kg	1390 kg	1460 kg	1460 kg
11000 ft - 7		1700 kg	1715 kg	1640 kg	1715 kg	1640 kg	1715 kg	1560 kg	1640 kg	1460 kg	1530 kg	1350 kg	1420 kg	1420 kg
12000 ft - 9		1670 kg	1715 kg	1590 kg	1715 kg	1590 kg	1715 kg	1520 kg	1590 kg	1430 kg	1490 kg	1310 kg	1380 kg	1380 kg
13000 ft -11				1550 kg	1715 kg	1550 kg	1715 kg	1470 kg	1540 kg	1380 kg	1440 kg	1270 kg	1340 kg	1340 kg
14000 ft -13				1490 kg	1715 kg	1490 kg	1715 kg	1430 kg	1500 kg	1340 kg	1400 kg	1240 kg	1300 kg	1300 kg
15000 ft -15				1440 kg	1715 kg	1440 kg	1715 kg	1380 kg	1450 kg	1300 kg	1360 kg	1200 kg	1260 kg	1260 kg
16000 ft -17				1390 kg	1715 kg	1390 kg	1715 kg	1330 kg	1400 kg	1260 kg	1310 kg	1160 kg	1220 kg	1220 kg
17000 ft -19				1350 kg	1715 kg	1350 kg	1715 kg	1290 kg	1350 kg	1220 kg	1270 kg	1120 kg	1180 kg	1180 kg
18000 ft -21						1260 kg	1715 kg	1260 kg	1300 kg	1180 kg	1230 kg	1080 kg	1140 kg	1140 kg
19000 ft -23						1200 kg	1715 kg	1200 kg	1260 kg	1130 kg	1180 kg	1050 kg	1100 kg	1100 kg
20000 ft -25						1160 kg	1715 kg	1160 kg	1210 kg	1090 kg	1140 kg			1060 kg

HB-ZCA

01.11.2010

Empty Weight :

1'068 kg / arm 4,23 m

Ski box / Cargo Extender :

6,5 kg / arm 4,44 m

BELL 206 B III - NORMAL PROCEDURES – PREFLIGHT CHECK

FLIGHT MANUAL
EC 120 B



4.2 PREFLIGHT CHECK

- Check that the area is clean and clear.
- Check that the aircraft is clean and unobstructed.
- Remove picketing equipment if necessary.
- Carry out the following checks :

4.2.1 EXTERIOR CHECK

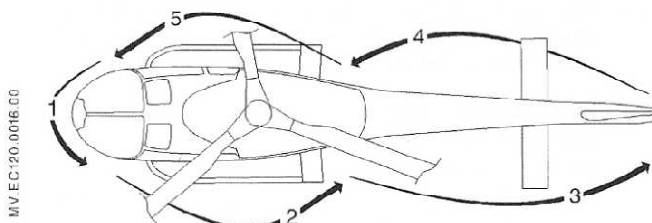


Figure 4-1: Sequence of Checks

Station 1

- | | |
|--|---|
| - Pitot tube | Cover removed - check condition. |
| - Sideslip indicator | Check condition. |
| - Transparent panel..... | Check condition. |
| - Landing gear (crossmembers, skids, wear resistant plates)..... | Secure - visual check. |
| - Front Air intake..... | Blanking cover removed - Clear (water, snow, foreign objects) |

Station 2

- | | |
|-------------------------------------|---|
| - Doors | Closed. |
| - MGB-Engine LH cowlings | Opening. |
| - MGB | Oil level. |
| - Hydraulic compact unit..... | Oil level. |
| - Engine | Oil level. |
| - Transmission deck and Engine | Condition, cleanliness, absence of leaks. |

Station 2 (cont'd)

- MGB-Engine LH cowling..... Closed, correctly locked.
- Fuel filler plug..... Closed, locked.
- Static port Blank removed, clear.
- Lower central cowling..... Closed.
- Fuel tank..... Absence of leaks (at the level of the drain).
- Main rotor head Visual inspection, rotor head, sleeves, spherical thrust bearing, adapters, bonding braids.
- Main rotor blades Secured, visual inspection from ground, no impact.
- Exhaust pipe Condition – Cover removed.
- Rear cargo door Opened, check battery attachment connections.
Check for snow in the tail boom
Closed, locked.
- Tail boom Condition, condition of antennas.

Station 3

- Stabilizer..... General condition.
- Tail rotor blades Condition, no impact.
- Tail rotor hub fairing..... No rotation (paint marks).

Station 4

- Yaw control rod..... Secured.
- TGB Oil level.
- Stabilizer..... General condition.
- Tail boom Condition, condition of antennas.

Station 5

- Static port Blank removed, clear.
- RH cargo door Opening.
- Electrical master box
Circuit breakers..... All set.
- RH cargo compartment Carried objects stowed, door closed and locked.

Station 5(cont'd)

- MGB-Engine RH cowling Opening.
- Fan and cooling radiator Condition, cleanliness, absence of leaks.
- Engine air intake and transmission deck..... Cleanliness, absence of foreign objects.
- MGB-Engine RH cowling Closed, correctly locked.
- EPU door..... Closed.
- Lower central cowling Closed.
- Pitot-Static systems..... Drained.
- Landing gear (crossmembers, skids, wear resistant plates)..... Condition, attachment, visual inspection.

4.2.2 INTERIOR CHECK

- Cabin Clean.
- Blanking plate of pedal unit.... Installed (if single pilot configuration).
- Fire extinguisher Fitted and checked.
- Breakers All set.
- Objects carried Stowed.
- Freight..... Stowed.
- Door jettison Checked, lockwired.

4.2.3 TURNAROUND CHECK

- Overall aspect Condition, cleanliness.
- Engine / MGB Oil level.
- Main and tail rotor blades (from ground) Condition.
- Loads Secured.
- All doors and cowlings Locked.

NOTE 1

If the aircraft is to be parked some time between flights, temporary picketing is recommended by fitting blanks, covers, and blade socks. In this case, perform a complete exterior check.

NOTE 2

Perform a complete exterior check if the aircraft is to be parked under snow precipitation.

ALERT CHECKLISTE

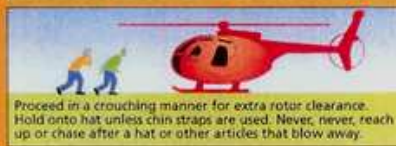
QUI	QUAND	QUOI	COMMENT	CONTACT
EQUIPAGE	Immédiat 1	Alerte	REGA <ul style="list-style-type: none"> - Ambulance - Police - Pompiers 	1414 canal K/R 144 117 118
	Immédiat 2	Secours	<ul style="list-style-type: none"> - sécuriser le site de l'accident - actions pour sauver les vies - information aux sauveteurs 	
	Immédiat 3	Information	Communication externe EXCLUSIVEMENT par le management de la COMPAGNIE. Aucune information aux médias ou tiers	
			<ul style="list-style-type: none"> - Management compagnie - Responsable des opérations - Management technique 	
		Protocole	- noter tous les appels et messages	

Les principes les plus importants lors de l'alerte

Alerte	Que s'est-il passé Où cela s'est-il passé (lieu, rue, montagne, altitude, coordonnées, etc.) Quand cela s'est-il passé Qui est concerné (nombres personnes, blessés, décès, etc.) Hélicoptère et immatriculation Quelles mesures ont été prises Tous les appels, messages et mesures prises ont été enregistrés jusqu'à ce que le management prenne le relais
Proches	Les proches sont informées exclusivement par le management ou une personne autorisée par le management
Information	L'information à des tiers et aux médias est effectuée exclusivement par le management ou une personne autorisée par le management

SAFETY AROUND HELICOPTERS

APPROACHING OR LEAVING A HELICOPTER



LANDING, TAKE-OFF AND LOADING OPERATIONS

