



GACA Circular No. R-11-2010

15 April 2010

TO: All GACA CERTIFICATE HOLDERS AND OPERATORS OF SAUDI ARABIAN REGISTERED AIRCRAFT

SUBJECT: Requirements for Additional Equipment

In accordance with the Civil Aviation Act of the Kingdom of Saudi Arabia (KSA) as approved by the Council of Ministers Resolution No. 185 dated 17/07/1426H and issued by the Royal Decree No. M/44 dated 18/07/1426H. (23/08/2005G), and based on the authority granted in Article 179 of the Act, the following Regulations are issued under the authority of the President of General Authority of Civil Aviation, as a duly delegated representative of the GACA Board of Directors, in accordance with Order No.T-41, dated 30/12/1429H (28/12/2008G). These additional regulations are being issued in order to bring the GACA/FAR aircraft equipment requirements into full compliance with the international standards contained in ICAO Annex 6.

With effect from 01/01/2012 the following additional equipment requirements apply;

1. Flight Data Recorders:

Notwithstanding the GACA/FAR requirements for flight data recorders contained in GACA/FAR 91.609, 121.343, 121.344, 125.225, 125.226, 129.20 and 135.152, the GACA requires that:

The following additional requirements for flight data recorders will apply:

- a) All aircrafts of a maximum certificated take-off mass of over 5 700 kg shall be equipped with a Type IA FDR.
- b) All multi-engined turbine powered aircraft of a maximum certificated take-off mass of 5 700 kg or less shall be equipped with a Type IIA FDR.

A Type IA FDR shall record the parameters required to determine accurately the aircraft flight path, speed, attitude, engine power, configuration and operation. The parameters that satisfy the requirements for a Type IA FDR are listed in the paragraphs below. The parameters without an asterisk (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aircraft systems or the flight crew to operate the aircraft.

The following parameters satisfy the requirements for flight path and speed:

- Pressure altitude



- Indicated airspeed or calibrated airspeed
- Air-ground status and each landing gear air-ground sensor when practicable
- Total or outside air temperature
- Heading (primary flight crew reference)
- Normal acceleration
- Lateral acceleration
- Longitudinal acceleration (body axis)
- Time or relative time count
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Groundspeed*
- Radio altitude*

The following parameters satisfy the requirements for attitude:

- Pitch attitude
- Roll attitude
- Yaw or sideslip angle*
- Angle of attack*

The following parameters satisfy the requirements for engine power:

- Engine thrust/power: propulsive thrust/power on each engine, cockpit thrust/power lever position
- Thrust reverse status*
- Engine thrust command*
- Engine thrust target*
- Engine bleed valve position*
- Additional engine parameters*: EPR, N1, indicated vibration level, N2, EGT, TLA, fuel flow, fuel cut-off lever position, N3

The following parameters satisfy the requirements for configuration:

- Pitch trim surface position
- Flaps*: trailing edge flap position, cockpit control selection
- Slats*: leading edge flap (slat) position, cockpit control selection
- Landing gear*: landing gear, gear selector position
- Yaw trim surface position*
- Roll trim surface position*
- Cockpit trim control input position pitch*
- Cockpit trim control input position roll*
- Cockpit trim control input position yaw*
- Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection
- De-icing and/or anti-icing systems selection*
- Hydraulic pressure (each system)*
- Fuel quantity*
- AC electrical bus status*
- DC electrical bus status*
- APU bleed valve position*
- Computed centre of gravity*



The following parameters satisfy the requirements for operation:

- Warnings
- Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis
- Marker beacon passage
- Each navigation receiver frequency selection
- Manual radio transmission keying and CVR/FDR synchronization reference
- Autopilot/autothrottle/AFCS mode and engagement status*
- Selected barometric setting*: pilot, first officer
- Selected altitude (all pilot selectable modes of operation)*
- Selected speed (all pilot selectable modes of operation)*
- Selected Mach (all pilot selectable modes of operation)*
- Selected vertical speed (all pilot selectable modes of operation)*
- Selected heading (all pilot selectable modes of operation)*
- Selected flight path (all pilot selectable modes of operation)*: course/DSTRK, path angle
- Selected decision height*
- EFIS display format*: pilot, first officer
- Multi-function/engine/alerts display format*
- GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warnings, and advisories, on/off switch position
- Low pressure warning*: hydraulic pressure, pneumatic pressure
- Computer failure*
- Loss of cabin pressure*
- TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*
- Ice detection*
- Engine warning each engine vibration*
- Engine warning each engine over temperature*
- Engine warning each engine oil pressure low*
- Engine warning each engine over speed*
- Wind shear warning*
- Operational stall protection, stick shaker and pusher activation*
- All cockpit flight control input forces*: control wheel, control column, rudder pedal cockpit input forces
- Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path
- Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path
- DME 1 and 2 distances*
- Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran C, ILS
- Brakes*: left and right brake pressure, left and right brake pedal position
- Date*
- Event marker*
- Head up display in use*
- Para visual display on*



A Type IIA FDR shall record at least the parameters in the paragraph below. However, other parameters may be substituted with due regard to the aircraft type and the characteristics of the recording equipment.

1. Time
2. Pressure
3. Indicated
4. Heading
5. Normal acceleration
6. Pitch attitude
7. Roll
8. Radio transmission keying
9. Power on each engine
10. Trailing edge flap or cockpit control selection
11. Leading edge flap or cockpit control selection
12. Thrust reverser position Stowed, in transit, and reverse
13. Ground spoiler/speed brake selection
14. Outside air temperature
15. Autopilot/auto throttle/AFCS mode and engagement status

Note 1.— Parameter requirements, including range, sampling, accuracy and resolution, are as contained in GACA/FAR Part 91, 121, 135 as appropriate to the operating rules under which the aircraft operates.

Note 2.— The number of parameters to be recorded will depend on aircraft complexity. Parameters without an (*) are to be recorded regardless of aircraft complexity. Those parameters designated by an (*) are to be recorded if an information source for the parameter is used by aircraft systems and/or flight crew to operate the aircraft.

2. Accurate Timepiece for VFR flights

In addition to equipment as indicated in GACA/FAR Part 91.205;

- a) All aircraft when operated as VFR flights shall be equipped with an accurate timepiece indicating the time in hours, minutes and seconds;
- b) VFR flights which are operated as controlled flights shall also be equipped in accordance with GACA/FAR 91.205(d).

3. Survival Equipment over Designated Areas

- a) Unless the airplane has the following equipment, no person may conduct a Commuter and On Demand Operation or a domestic operation within the Kingdom of Saudi Arabia over an uninhabited area or any other area that (in its operations specifications) the GACA specifies required equipment for search and rescue in case of an emergency:



- i. Suitable pyrotechnic signaling devices.
- ii. An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water activated batteries) that are essentially unaffected during probable storage intervals.
- iii. Enough survival kits, appropriately equipped for the route to be flown for the number of occupants of the airplane.

4. Supplemental Oxygen for High Altitude Flights

Notwithstanding the regulations pertaining to supplemental oxygen specified in GACA/FAR 91.211, 121.327, 121.329, 121.331, 121.333 and 135.157, the GACA requires that:

Note.— Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:

| Absolute pressure | Feet | Metres |
|-------------------|-------|--------|
| 700 hPa | 10000 | 3 000 |
| 620 hPa | 13000 | 4 000 |
| 376 hPa | 25000 | 7 600 |

- a) An aircraft intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required as follows:

The flight shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

- i. all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and
 - ii. the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.
- b) An aircraft intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and



dispensing apparatus capable of storing and dispensing the oxygen supplies required as follows:

A flight to be operated with a pressurized aircraft shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

- c) Pressurized aircraft newly introduced into service on or after 1 July 1962 and intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa shall be equipped with a device to provide positive warning to the pilot of any dangerous loss of pressurization.
- d) An aircraft intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa, cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa and for which the individual certificate of airworthiness is first issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment to satisfy the requirements of paragraph b). The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

5. Flight in Icing Conditions

- a) All aeroplanes shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

6. Terrain Awareness and Warning Systems (TAWS)

Notwithstanding the GACA/FAR requirements for terrain awareness and warning systems contained in GACA/FAR 91.223, the GACA requires that:

- a) All turbine-engined airplanes of a maximum certificated take-off mass in excess of 5 700 kg shall be equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)-C151.
- b) All piston-engined airplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with an



approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)-C151.

7. Emergency Locator Transmitters (ELT)

Notwithstanding the GACA/FAR requirements for emergency locator transmitters contained in GACA/FAR 91.207, the GACA requires that:

- a) All aircraft authorized to carry more than 19 passengers shall be equipped with at least two ELTs, one of which shall be automatic.
- b) All aircraft authorized to carry 19 passengers or less shall be equipped with at least one automatic ELT.
- c) ELT equipment carried to satisfy the requirements of paragraph a) and b) shall operate in accordance with the relevant provisions of FAA TSO TSO-C126 - 406 MHz EMERGENCY LOCATOR TRANSMITTER (ELT).

8. Airborne Collision Avoidance Systems (ACAS)

Notwithstanding the GACA/FAR requirements for airborne collision avoidance systems contained in GACA/FAR 121.356, 135.180, 125.224 and 129.18, the GACA requires that:

- a) All turbine-engined aircrafts of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).
- b) The airborne collision avoidance system shall operate in accordance with the relevant provisions of FAA TSO-C119b - TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) AIRBORNE EQUIPMENT, TCAS II (which can be found on www.faa.gov) or ICAO Annex 10, Volume IV.

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Any inquiries or feedback concerning GACA Regulations shall be addressed to VP GACA-S&ER, Fax No. +966-2-6855284.

 President, General Authority of Civil Aviation,
Kingdom of Saudi Arabia,


Eng. Abdullah M. N. Rehaimi