

ANNEX C

Aerodromes & Routes

This Annex provides further guidance and illustrative examples on developing route guides and associated documents.

APPENDIX C1

Route guide

Subjects which normally form part of a route guide include, but are not limited to, the following:

- information on and procedures for the areas to be navigated, on the aerodromes/heliports to be used and the associated air navigation facilities, including:
 - Physical attributes of the aerodrome and route;
 - Lighting type and intensity and procedures;
 - Aerodrome Rescue and Fire Fighting services;
 - Known hazards;
 - En route alternate aerodromes;
 - Aerodrome operator and contact details; and
 - Approach and landing procedures;
- localised weather and terrain information (particularly important if treacherous area or one not used on a regular basis);
- information on the search and rescue facilities in the area over which the aircraft will be flown;
- the frequencies and circumstances in which a radio listening watch is to be maintained;
- information on the procedures to be followed in the event of radio communications failure;
- procedures for pilots observing an accident or intercepting a distress communication;
- ATS flight plan requirements;
- information on meteorological facilities and services, aircraft observations and air-reports
- refuelling locations, fuel availability and procedures
- information on the operator's own organisation, e.g. company communication frequencies, handling agents at aerodromes etc.; and
- the ground-air visual signal code for use by survivors of an accident or forced landing.

An operator may wish to include other information in the guide, but care should be taken to ensure the document is easy to read and manage in case it is needed in the cockpit.

Most of the information that goes to make up the contents of a route guide is obtained from the Aeronautical Information Publication (AIP). It is essential that the information be kept current and consistent with the regulations, orders, the AIP, NOTAMs, aeronautical information circulars and relevant ICAO publications and charts. This will require continual monitoring to ensure that the route guide is amended and kept current.

In addition, the need to make the route guide usable in the cockpit can make it necessary to extract and present the information in a more condensed form than AIP-type presentation. This can be quite a task and operators may want to consider purchasing route guides, and amendment services, tailored to their particular requirements from commercial firms or from very large operators whose resources are such that they prepare and publish their own route guide.

Amendments should be published on a regular basis, should be simple to incorporate, and should be numbered and recorded in the front of a route guide so as to permit the user of a guide to immediately determine the currency of a particular entry.

APPENDIX C2

Usability of aerodromes – sample guidance

Criteria for determining the usability of aerodromes

Departure, destination and alternate aerodromes considered for operations must be *adequate* for the type of aircraft and operation concerned. To be used for an operation they should be *usable* (complying with given weather minima) at the time of the operation.

Adequate aerodrome

An adequate aerodrome is an aerodrome which the operator considers to be satisfactory, taking account of the applicable performance requirements and runway characteristics. In addition, it should be anticipated that, at the expected time of use, the aerodrome will be available and equipped with the necessary ancillary services, such as ATS, sufficient lighting, communications, weather reporting, nav aids and emergency services.

In particular, an aerodrome is adequate if:

- the available runway length is sufficient to meet aircraft performance requirements (required take-off and landing distance);
- rescue and fire fighting aerodrome category is compatible with the aircraft; and
- the pavement strength is compatible with aircraft weight;
- The apron and taxiways have sufficient dimensions, clearances and strength to cater for the aircraft;
- The runway strip as provided meets the AIP strip width requirement for the aircraft; and
- An obstacle survey which complies with the coding of the aircraft has been conducted on all approaches by the aerodrome operator and supplied to the aircraft operator.

Furthermore, the following items should be considered when necessary:

- landing or over-flying permission has been obtained;
- the flight crew have the required qualifications, experience and documentation including up-to-date approach and aerodrome charts;
- at the expected time of use, the aerodrome is equipped with the necessary ramp handling facilities, as applicable: refuelling, towing, steps or aerobridges, cargo loading, ground power units, air starters, catering, toilet services etc.; and
- for international flight: security, customs and immigration services are available at the expected time of use.

Usable aerodrome

An aerodrome is *usable* if:

- the aerodrome is adequate for the operation; and
- the meteorological conditions satisfy the planning minima for the expected landing time (within defined buffer periods), and meet the approach, runway and aircraft capabilities and crew qualifications (associated with the prevailing meteorological conditions).

Planning minima

Planning minima are relevant to *forecast* aerodrome weather conditions.

Planning minima for take-off alternate aerodrome

An adequate aerodrome may be usable as a take-off alternate if the weather reports or forecasts are in accordance with the provisions of AIP-ENR – *Alternate Aerodromes*. The cloud ceiling must be taken into account when the only approaches available are non-precision and/or circling approaches. Any limitation related to one-engine inoperative operation must be taken into account also.

Planning minima for destination aerodrome

An adequate aerodrome may be usable as a destination (except where the aerodrome is isolated) if the weather reports or forecasts indicate that, during a period in accordance with AIP-ENR – *Alternate Aerodromes* the weather conditions (RVR/visibility and for non-precision or circling approaches, ceiling) will be at or above the approach operating minima.

Planning minima for en-route and destination alternate aerodromes and isolated destination aerodromes

An adequate aerodrome may be usable for destination alternate, en-route alternate or as a destination aerodrome when isolated, if the weather reports or forecasts indicate that, during a period commencing 30 minutes before and ending 1 hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the planning minima as follows:

Table 1: Planning minima: En-route alternates, destination alternates and isolated destination aerodromes

Type of approach	Planning Minima
Cat II and Cat III	Cat I minima (RVR)
Cat I	Non-precision approach minima (ceiling/RVR)
Non-precision	Non-precision approach minima plus 200 ft/1000 m (MDH/MDA + 200 ft/RVR + 1000 m)
Circling	Circling minima

Note: “Non-precision minima” mentioned in the table above, means the next highest minimum that is available in the prevailing wind and serviceability conditions; Localiser only approaches, if published, are considered to be “non-precision” in this context.

Example 1 – Airport XXXX

Runway 07	DA (DH) / MDA (MDH) (ft)	Visibility (m)
ILS DME	222 (200)	RVR 550
LOC DME	410 (388)	2400
VOR DME	580 (558)	2800
Runway 25	DA (DH) / MDA (MDH) (ft)	Visibility (m)
CAT 2 ILS	216 (193)	RVR 500
ILS DME	292 (269)	RVR 650
LOC DME	410 (387)	2400
VOR DME	450 (431)	2400

If Runway 07 at Airport XXXX is the expected runway to be used due to weather forecast:

- *Type of approach planned: CAT 1 - planning minima - Non-precision (LOC DME) apply: 410 (388) ft / 2400 m.*

If Runway 25 at Airport XXXX is the expected runway to be used due to weather forecast:

- *Type of approach planned: CAT 2 - planning minima CAT 1 apply: 292 (269) ft / RVR 650m.*

Example 2 – Airport YYYY

Runway 07	DA (DH) / MDA (MDH) (ft)	Visibility (m)
LOC DME	410 (388)	2400
VOR DME	580 (558)	2800
Runway 25	DA (DH) / MDA (MDH) (ft)	Visibility (m)
ILS DME	292 (269)	RVR 650
LOC DME	410 (387)	2400
VOR DME	450 (431)	2400

If Runway 07 at Airport YYYY is the expected runway to be used due to weather forecast:

- *Type of approach planned: Non-precision (LOC DME) planning minima - Non-precision (VOR DME) + 200 ft / + 1000 m apply: 780 (788) ft / 3800 m.*

If Runway 25 at Airport YYYY is the expected runway to be used due to weather forecast:

- *Type of approach planned: CAT 1 planning minima - Non-precision (LOC DME) apply: 410 (387) ft / 2400 m.*

APPENDIX C3

Meteorological Guide – Example¹

For planning purposes, an aerodrome shall be considered to be below minimum if:

- the RVR or meteorological visibility is below the applicable minima (precision approach);
- the ceiling or vertical visibility is below the applicable decision height or minimum descent height (non-precision approach / or circling only);
- the steady crosswind component exceeds the prescribed limitation for the aeroplane type;
- the steady (mean) wind should be used and the gusts may be disregarded; and
- the head wind or tail wind component exceeds the prescribed limitation for the aeroplane type.

Whenever a forecast contains meteorological conditions indicating “below minimum” at ETA which are prefixed by:

- BECMG AT
 - Deterioration or improvement:
 - Applicable from the time of start of the change. Mean wind must be within limits. Gusts may be disregarded.
- BECMG FM, BECMG TL, BECMG FM...TL
 - Deterioration:
 - Applicable from the time of start of the change. Mean wind must be within required limits. Gusts may be disregarded.
 - Improvement:
 - Applicable from the time of end of the change. Mean wind must be within required limits. Gusts may be disregarded.
- TEMPO (alone), TEMPO FM, TEMPO TL, TEMPO FM...TL, PROB 30/40 (alone)
 - Deterioration:
 - Transient / showery conditions: Not applicable. Mean wind and gusts exceeding required limits may be disregarded.
 - Persistent conditions in connection with e.g. haze, mist, fog, dust/sandstorm, continuous precipitation: Applicable. Mean wind should be within required limits. Gusts may be disregarded.
 - Improvement: In any case should be disregarded.
- PROB TEMPO
 - Deterioration: May be disregarded.
 - Improvement: Should be disregarded.

¹ The example is drawn from the Airbus Industrie publication *Airlines Operations Policy Manual* published on the www.airbus.com website (for subscribers only) and used with permission and courtesy of the copyright holder.

Methods for the determination of aerodrome operating minima

The term minima refers to the aerodrome weather conditions and defines the minimum visibility (horizontal and vertical) prescribed for taking off from, or landing a civil aircraft to this particular aerodrome.

Different concepts of minima:

- **Aircraft capability** given in the Aircraft Flight Manual defines the lowest minima for which the aircraft has been certified.
- **Aerodrome operating minima** noted on the aerodrome chart, established in accordance with the national authorities of the aerodrome.
- **Operator's minima** approved by the national authority of the operator. They are the lowest minima that the operator is allowed to use on a specified aerodrome. They cannot be lower than the aircraft capability and the minima published on the aerodrome chart except when specifically approved by the national authority of the aerodrome.
- These operator's minima are also called "**aerodrome operating minima**" by the operator (but with a different meaning than in the previous case).
- **Crew minima** are the minima that the crew is authorised to operate. They are based upon the qualification of the flight crewmembers.

Aerodrome operating minima

As a general rule the aerodrome operating minima are the minima indicated on the instrument departure and approach charts for the aerodrome.

However, at the pilot-in-command's discretion, if other factors indicate that the operation cannot be conducted with the required standard of safety the selected minima can be higher than the allowed operating minima. NOTAM may affect minima.

Take-off operating minima

Before commencing a take-off, the pilot-in-command must satisfy himself that:

- The visibility or RVR is equal or better than the take-off visibility or RVR limits.
- The weather conditions (ceiling and visibility) at the departure airport are equal or better than the applicable minima for landing (approach) at that airport or at a usable take-off alternate as defined in planning minima.

When no reported meteorological visibility or RVR is available, the pilot-in-command may determine that sufficient visual reference exists to permit a safe take-off.

When the reported meteorological visibility is below that required for take-off and RVR not reported, a take-off may only be commenced if the pilot-in-command can determine that the actual visibility along the take-off runway is equal or better than the required minimum.

For all aircraft, performance is such that in the event of a power loss at any point during take-off, the aircraft can either stop or continue to a height of 1500 feet above the aerodrome while clearing all obstacles by the required margins.

Therefore the take-off minima must be expressed as RVR/visibility values and may not be less than those given in Table 1, below:

Table 1 – RVR/Visibility for take-off

Facilities	RVR / Visibility⁽³⁾
Nil (day only)	500 m
Runway edge lighting and/or centreline marking	250/300 m ^{(1) (2)}
Runway edge and centreline lighting	200/250 m ⁽¹⁾
Runway edge, centreline lighting and multiple RVR information	150/200 m ^{(1) (4)}

Notes:

- (1) The higher values apply to aircraft with V_{AT} : $141 \text{ kt} \leq V_{AT} < 166 \text{ kt}$.
- (2) For night operations, at least runway edge and runway end lights are required.
- (3) The reported RVR/Visibility representative of the initial part of the take-off run may be replaced by pilot assessment.
- (4) The required RVR value must be achieved for all of the relevant RVR reporting points except as stated in (3), above.