

CAT.OP.MPA.181 Fuel/energy scheme – fuel/energy planning and in-flight re-planning policy – aeroplanes

Regulation (EU) 2021/1296

The operator shall ensure that the pre-flight calculation of the usable fuel/energy that is required for a flight includes:

- (1) **taxi fuel/energy** that shall not be less than the amount expected to be used prior to take-off;
- (2) **trip fuel/energy** that shall be the amount of fuel/energy that is required to enable the aeroplane to fly from take-off, or from the point of in-flight re-planning, to landing at the destination aerodrome;
- (3) **contingency fuel/energy** that shall be the amount of fuel/energy required to compensate for unforeseen factors;
- (4) **destination alternate fuel/energy**:
 - (i) when a flight is operated with at least one destination alternate aerodrome, it shall be the amount of fuel/energy required to fly from the destination aerodrome to the destination alternate aerodrome; or
 - (ii) when a flight is operated **with no destination alternate aerodrome**, it shall be the amount of fuel/energy required to hold at the destination aerodrome, while enabling the aeroplane to perform a safe landing, and to allow for deviations from the planned operation; as a minimum, this amount shall be **15-minute** fuel/energy at holding speed at 1 500ft (450 m) above the aerodrome elevation in standard conditions, calculated according to the estimated aeroplane mass on arrival at the destination aerodrome;
- (5) **final reserve fuel/energy** that shall be the amount of fuel/energy that is calculated at holding speed at 1 500ft (450 m) above the aerodrome elevation in standard conditions according to the aeroplane estimated mass on arrival at the destination alternate aerodrome, or destination aerodrome when no destination alternate aerodrome is required, and shall not be less than:
 - (i) for aeroplanes with reciprocating engines, the fuel/energy to fly for **45 minutes**; or
 - (ii) for turbine-engined aeroplanes, the fuel/energy to fly for **30 minutes**;
- (6) **additional fuel/energy**, if required by the type of operation; it shall be the amount of fuel/energy to enable the aeroplane to land at a fuel/energy en route alternate aerodrome (fuel/energy ERA aerodrome critical scenario) in the event of an aircraft failure that significantly increases the fuel/energy consumption at the most critical point along the route; this additional fuel/energy is required only if the minimum amount of fuel/energy that is calculated according to points (c)(2) to (c)(5) is not sufficient for such an event;
- (7) **extra fuel/energy** to take into account anticipated delays or specific operational constraints; and
- (8) **discretionary fuel/energy**, if required by the commander.

BASIC FUEL SCHEME — PRE-FLIGHT CALCULATION OF USABLE FUEL FOR PERFORMANCE CLASS A AEROPLANES

For the pre-flight calculation of the usable fuel, the operator should:

- (a) for **taxi fuel**, take into account the local conditions at the departure aerodrome and the **APU consumption**;
- (b) for **trip fuel**, include:
 - (1) fuel for take-off and climb from the aerodrome elevation to the initial cruising level/altitude, taking into account the expected departure routing;
 - (2) fuel from the top of climb to the top of descent, including any step climb/descent;
 - (3) fuel from the top of descent to the point where the approach procedure is initiated, taking into account the expected arrival routing; and
 - (4) fuel for making an approach and landing at the destination aerodrome;
- (c) for **contingency fuel**, calculate for unforeseen factors either:
 - (1) 5 % of the planned trip fuel or, in the event of in-flight re-planning, 5 % of the trip fuel for the remainder of the flight; or
 - (2) an amount to fly for 5 minutes at holding speed at 1 500 ft (450 m) above the destination aerodrome in standard conditions,
whichever is the higher;
- (d) for **destination alternate** fuel, include:
 - (1) when the aircraft is operated with one destination alternate aerodrome:
 - (i) fuel for a missed approach from the applicable DA/H or MDA/H at the destination aerodrome to the missed-approach altitude, taking into account the complete missed-approach procedure;
 - (ii) fuel for climb from the missed-approach altitude to the cruising level/altitude, taking into account the expected departure routing;
 - (iii) fuel for cruising from the top of climb to the top of descent, taking into account the expected routing;
 - (iv) fuel for descent from the top of descent to the point where the approach is initiated, taking into account the expected arrival routing; and
 - (v) fuel for making an approach and landing at the destination alternate aerodrome; and
 - (2) when the aircraft is operated with two destination alternate aerodromes, the amount of fuel that is calculated in accordance with point (d)(1), based on the destination alternate aerodrome that requires the greater amount of fuel;
- (e) for **FRF**, comply with point [CAT.OP.MPA.181\(c\)](#);
- (f) for **additional fuel**, include an amount of fuel that allows the aeroplane to proceed,

in the event of an engine failure or loss of pressurisation, from the most critical point along the route to a fuel en route alternate (fuel ERA) aerodrome in the relevant aircraft configuration, hold there for **15 minutes at 1 500 ft** (450 m) above the aerodrome elevation in standard conditions, make an approach, and land;

- (g) for **extra fuel**, include anticipated delays or specific operational constraints that can be predicted; and
- (h) for **discretionary fuel**, include a quantity at the sole discretion of the commander.

/might be fuel tankering

BASIC FUEL SCHEME WITH VARIATIONS — CONTINGENCY FUEL

Easy Access Rules for Air Operations ANNEX IV (Part-CAT)

SUBPART B: OPERATING PROCEDURES

- (a) Contingency fuel variations are methods of reducing the basic amount of contingency fuel based on established mitigating measures.
- (b) If the operator establishes and maintains a fuel consumption monitoring system for individual aeroplanes, and uses valid data for fuel calculation based on such a system, the operator may use any of the requirements in point (c) or (d) of this AMC to calculate the contingency fuel.
- (c) The contingency fuel should be the fuel described in points (c)(1) or (c)(2) of this AMC, whichever is higher:
 - (1) an amount of fuel that should be either:
 - (i) not less than 3 % of the planned trip fuel, or in the event of in-flight re-planning, 3 % of the trip fuel for the remainder of the flight provided that a fuel en route alternate (fuel ERA) aerodrome is available; or
 - (ii) an amount of fuel sufficient for **20-minute flying time** based upon the planned trip fuel consumption; or
 - (iii) an amount of fuel based on a statistical fuel method that ensures an appropriate statistical coverage of the deviation from the planned to the actual trip fuel; prior to implementing a statistical fuel method, a continuous 2-year operation is required during which statistical contingency fuel (SCF) data is recorded — note: to use SCF on a particular city pair/aeroplane combination, sufficient data is required to be statistically significant; the operator should use this method to monitor the fuel consumption on each city pair/aeroplane combination, and to carry out a statistical analysis to calculate the required contingency fuel for that city pair/aeroplane combination;
or
 - (2) an amount of fuel to fly for 5 minutes at holding speed at 1 500 ft (450 m) above the destination aerodrome in standard conditions.
- (d) RCF procedure: if the operator's fuel policy includes pre-flight planning to a destination 1 aerodrome (commercial destination with an RCF procedure using a decision point along the route) and a destination 2 aerodrome (optional refuelling destination), the amount in the

pre-flight calculation of the required usable fuel should be greater than the sum in points (d)(1) or (d)(2):

(1) the sum of:

- (i) taxi fuel;
- (ii) trip fuel to the destination 1 aerodrome via the decision point;
- (iii) contingency fuel equal to not less than 5 % of the fuel that is estimated to be consumed from the decision point to the destination 1 aerodrome;
- (iv) the amount of fuel specified in [AMC2 CAT.OP.MPA.182](#): destination 1 alternate fuel or no alternate fuel if the remaining flying time from the decision point to destination 1 aerodrome is less than 6 hours;
- (v) FRF;
- (vi) additional fuel;
- (vii) extra fuel if there are anticipated delays or specific operational constraints; and
- (viii) discretionary fuel, if required by the commander; or

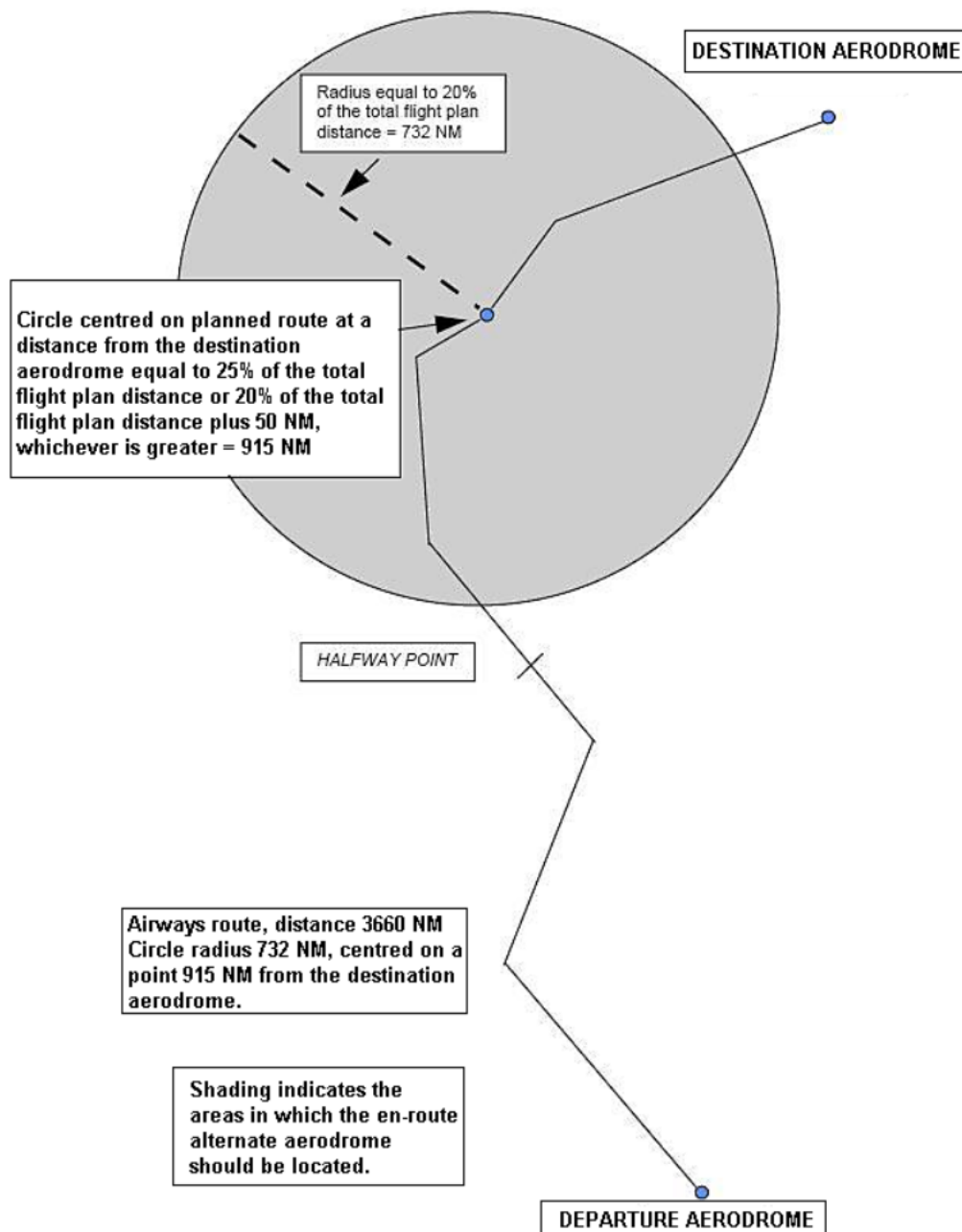
(2) the sum of:

- (i) taxi fuel;
- (ii) trip fuel to the destination 2 aerodrome via the decision point;
- (iii) contingency fuel equal to not less than the amount that is calculated in accordance with point (c) of this AMC, from the departure aerodrome to the destination 2 aerodrome;
- (iv) alternate fuel if a destination 2 alternate aerodrome is required;
- (v) FRF;
- (vi) additional fuel;
- (vii) extra fuel if there are anticipated delays or specific operational constraints; and
- (viii) discretionary fuel, if required by the commander.

BASIC FUEL SCHEME WITH VARIATIONS — LOCATION OF THE FUEL EN ROUTE ALTERNATE AERODROME TO REDUCE CONTINGENCY FUEL TO 3 %

The fuel en route alternate (fuel ERA) aerodrome should be located within a circle with a radius equal to 20 % of the total flight plan distance; the centre of this circle lies on the planned route at a distance from the destination aerodrome equal to 25 % of the total flight plan distance, or at least 20 % of the total flight plan distance plus 50 NM, whichever is greater. All distances should be calculated in still-air conditions (see Figure 1). The fuel ERA aerodrome should be nominated in the operational flight plan.

Figure 1 — Location of the fuel ERA aerodrome to reduce contingency fuel to 3 %



AMC7 CAT.OP.MPA.182 Fuel/energy scheme — aerodrome selection policy — aeroplanes

ED Decision 2022/005/R

BASIC FUEL SCHEMES WITH VARIATIONS — ISOLATED AERODROME — POINT OF NO RETURN

- (a) Unless destination alternate fuel is carried, the operator should use a destination aerodrome as an isolated aerodrome if the alternate fuel plus the FRF that is required to reach the nearest adequate destination alternate aerodrome is more than:
 - (1) **for aeroplanes with reciprocating engines**, the amount of fuel required to fly either for 45 minutes plus 15 % of the flying time planned for cruising, including FRF or for 2 hours, whichever is less; or
 - (2) **for turbine-engined aeroplanes**, the amount of fuel required to fly for **2 hours** with normal cruise consumption above the destination aerodrome, **including the FRF**.
- (b) If the operator's fuel planning policy includes an isolated aerodrome, a PNR should be determined by a computerised flight-planning system and specified in the operational flight plan. The required usable fuel for pre-flight calculation should be as indicated in points (b)(1) or (b)(2), whichever is greater:
 - (1) the sum of:
 - (i) taxi fuel;
 - (ii) trip fuel from the departure aerodrome to the isolated aerodrome via the PNR;
 - (iii) contingency fuel that is calculated in accordance with the operator's current fuel scheme;
 - (iv) **additional fuel**, if required, but not less than:
 - (A) for aeroplanes with reciprocating engines, the fuel to fly either for 45 minutes plus 15 % of the flight time planned for cruising or for 2 hours, whichever is less; or
 - (B) for turbine-engined aeroplanes, the fuel to fly for **2 hours** with normal cruise consumption above the destination aerodrome, including the FRF;
 - (v) extra fuel if there are anticipated delays or specific operational constraints; and
 - (vi) discretionary fuel, if required by the commander; or
 - (2) the sum of:
 - (i) taxi fuel;
 - (ii) trip fuel from the departure aerodrome to the fuel ERA PNR aerodrome via the PNR;
 - (iii) contingency fuel that is calculated in accordance with the operator's current fuel

scheme;

- (iv) additional fuel, if required, but not less than:
 - (A) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes; or
 - (B) for turbine-engined aeroplanes, fuel to fly for 30 minutes at holding speed at 1 500 ft (450 m) above the fuel ERA aerodrome elevation in standard conditions, which should not be less than the FRF;
- (v) extra fuel if there are anticipated delays or specific operational constraints; and
- (vi) discretionary fuel, if required by the commander.