

ANNEX Ib to EASA Opinion No 02/2020

Draft Annex to draft Commission Implementing Regulation (EU) .../... amending
Commission Regulation (EU) No 965/2012 as regards the requirements for
fuel/energy planning and management

Amendments to Annex I ‘Definitions for terms used in Annexes II to VIII’ to Commission
Regulation (EU) No 965/2012

1. The following definitions are inserted:

‘(8c) ‘alternate aerodrome’ means an adequate aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or land at the aerodrome of intended landing, where the necessary services and facilities are available, where aircraft performance requirements can be met, and which is operational at the expected time of use; ‘alternate aerodrome’ includes the following:

- ‘take-off alternate aerodrome’: an alternate aerodrome at which an aircraft would be able to land if it becomes necessary shortly after take-off and it is not possible to use the aerodrome of departure;
- ‘en route alternate (ERA) aerodrome’: an alternate aerodrome at which an aircraft would be able to land if a diversion becomes necessary while en route;
- ‘fuel/energy en route alternate (fuel/energy ERA) aerodrome’ means an ERA aerodrome that is required at the planning stage for use in the calculation of fuel/energy;
- ‘destination alternate aerodrome’: an alternate aerodrome at which an aircraft would be able to land if it becomes either impossible or inadvisable to land at the aerodrome of intended landing;

(31a) ‘current fuel/energy scheme’ means the approved fuel/energy scheme that is currently used by the operator;

(49d) ‘flight following’ means the recording in real time of departure and arrival messages by operational personnel to ensure that a flight is operating and has arrived at the destination aerodrome or an alternate aerodrome;

(49e) ‘flight monitoring’ means, in addition to the requirements defined for flight following:

- operational monitoring of flights by suitably qualified operational-control personnel from departure throughout all phases of the flight;
- communication of all available and relevant safety information between the operational-control personnel on the ground and the flight crew; and
- critical assistance to the flight crew in the event of an in-flight emergency or security issue, or at the request of the flight crew;

(50a) ‘flight time’ means:

- for aeroplanes, the total time from the moment an aeroplane first moves for the purpose of taking off until the moment the aeroplane finally comes to rest at the end of the flight;
 - for helicopters, the total time between the moment a helicopter's rotor blades start turning for the purpose of taking off until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped;
- (50b) 'flight watch' means, in addition to all elements defined for 'flight monitoring', the active tracking of a flight by suitably qualified operational-control personnel throughout all phases of the flight to ensure that the flight is following its prescribed route without unplanned deviations, diversions or delays;
- (104a) 'safe landing' means, in the context of the fuel/energy policy or fuel/energy schemes, a landing at an adequate aerodrome or operating site with no less than the final reserve fuel/energy remaining and in compliance with the applicable operational procedures and aerodrome operating minima;'
2. Definitions (26) 'contingency fuel' and (73) 'local helicopter operation' are amended as follows:
- '(26) 'contingency fuel/energy' means the fuel/energy required to compensate for unforeseen factors that could have an influence on the fuel/energy consumption to the destination aerodrome;'
- '(73) 'local helicopter operation (LHO)' means a commercial air transport operation of helicopters with a maximum certified take-off mass (MCTOM) over 3 175 kg and a maximum operational passenger seating configuration (MOPSC) of nine or less, by day, over routes navigated by reference to visual landmarks, conducted within a local and defined geographical area specified in the operations manual;'
3. Definitions (46) 'en-route alternate (ERA) aerodrome' and (51) 'fuel ERA aerodrome' are deleted.

Amendments to Annex II ‘AUTHORITY REQUIREMENTS FOR AIR OPERATIONS’
(Part-ARO) to Commission Regulation (EU) No 965/2012

4. Point ARO.OPS.225 is replaced by the following:

‘ARO.OPS.225 Approval of fuel/energy schemes

- (a) The competent authority shall approve the fuel/energy scheme proposed by a CAT operator if the operator demonstrates compliance with all applicable implementing rules related to fuel/energy for aeroplanes or helicopters involved in CAT.
- (b) The competent authority shall assess and oversee the fuel/energy planning and in-flight replanning, selection of aerodrome and, in-flight fuel/energy management policies associated with the fuel/energy schemes, together with the processes that support the implementation of these fuel/energy schemes.
- (c) In addition to (a) and (b) above, when approving individual fuel/energy schemes, the competent authority shall:
 - (1) verify that the operator has demonstrated the baseline safety performance of the current fuel/energy scheme;
 - (2) assess the capability of the operator to support the implementation of the proposed individual fuel/energy scheme; the following elements shall be considered as a minimum:
 - (i) the operator’s management system, and
 - (ii) the operator’s operational capabilities;
 - (3) verify that the operator’s safety risk assessment that supports the proposed individual fuel/energy scheme achieves an equivalent level of safety to that of the current fuel/energy scheme; and
 - (4) establish an oversight plan to carry out periodic assessments of the approved individual fuel/energy scheme to verify compliance of the scheme or decide whether the scheme should be amended or revoked.
- (d) The approval referred to in point CAT.OP.MPA.182 (d)(2) shall include a list of the isolated aerodromes that are specified by the operator for each aircraft type to which the approval applies.
- (e) Without prejudice to points ARO.GEN.120 (d) and (e), the competent authority shall notify the Agency when it starts the evaluation of an alternative means of compliance related to fuel/energy schemes.’.

Amendments to Annex III ‘ORGANISATION REQUIREMENTS FOR AIR OPERATIONS’ (Part-ORO) to Commission Regulation (EU) No 965/2012

5. Appendix I to Annex III (Part-ORO) is amended as follows:

‘Appendix I to Annex III (Part-ORO)

DECLARATION					
in accordance with Commission Regulation (EU) No 965/2012 on air operations					
Operator					
Name:					
Place in which the operator has its principal place of business or, if the operator has no principal place of business, place in which the operator is established or residing and place from which the operations are directed:					
Name and contact details of the accountable manager:					
Aircraft operation					
Starting date of operation and applicability date of the change:					
Information on aircraft, operation, and continuing-airworthiness management organisation ⁽¹⁾ :					
Type(s) of aircraft, registration(s) and main base:					
Aircraft MSN ⁽²⁾	Aircraft type	Aircraft registration ⁽³⁾	Main base	Type(s) of operation ⁽⁴⁾	Organisation responsible for continuing-airworthiness management ⁽⁵⁾
The operator shall obtain a prior approval ⁽⁶⁾ or specific approval ⁽⁷⁾ for certain operations before conducting such operations.					
Where applicable, details of approvals held (attach list of specific approvals, including specific approvals granted by a third country, if applicable).					
Where applicable, details of specialised-operations authorisation held (attach authorisation(s)).					
Where applicable, list of alternative means of compliance (AltMoC) with references to the AMC they replace (attach AltMoC).					

Statements
<input type="checkbox"/> The operator shall comply, and continues to comply, with the essential requirements set out in Annex V to Regulation (EU) 2018/1139 of the European Parliament and of the Council and with the requirements of Regulation (EU) No 965/2012.
<input type="checkbox"/> The management system documentation, including the operations manual, shall comply with the requirements of Annex III (Part-ORO), Annex V (Part-SPA), Annex VI (Part-NCC), or Annex VIII (Part-SPO) to Regulation (EU) No 965/2012 and all flights be made in accordance with the provisions of the operations manual as required by point ORO.GEN.110 (b) of Part-ORO.
<input type="checkbox"/> All operated aircraft shall hold a valid certificate of airworthiness in accordance with Commission Regulation (EU) No 748/2012 or meet the specific airworthiness requirements applicable to aircraft registered in a third country and subject to a lease agreement.
<input type="checkbox"/> All flight crew members shall hold a licence in accordance with Annex I to Commission Regulation (EU) No 1178/2011 as required by point ORO.FC.100 (c) of Annex III to Regulation (EU) No 965/2012, and cabin crew members, where applicable, be trained in accordance with Subpart CC of Part-ORO.
<input type="checkbox"/> If applicable, the operator shall implement and demonstrate conformance to a recognised industry standard. Reference of the standard: Certification body: Date of the last conformity audit:
<input type="checkbox"/> The operator shall notify to the competent authority any changes in circumstances affecting its compliance with the essential requirements set out in Annex V to Regulation (EU) 2018/1139 and with the requirements of Regulation (EU) No 965/2012 as declared to the competent authority through this declaration, and any changes to the information on and lists of AltMoC included in and annexed to this declaration as required by point ORO.GEN.120 (a) of Part-ORO.
<input type="checkbox"/> The operator shall confirm that the information disclosed in this declaration is correct.
Date, name, and signature of the accountable manager
<p>(1) If there is not enough space to list the required information in the declaration, the information shall be listed in a separate annex. The annex shall be dated and signed.</p> <p>(2) Manufacturer serial number.</p> <p>(3) If the aircraft is also registered with an air operator certificate (AOC) holder, specify the AOC number of the AOC holder.</p> <p>(4) ‘Type(s) of operation’ refers to the type of operations conducted with this aircraft, e.g. non-commercial operations or specialised operations, e.g. aerial photography flights, aerial advertising flights, news media flights, television and movie flights, parachute operations, skydiving, maintenance check flights.</p> <p>(5) Information about the organisation that is responsible for the continuing-airworthiness management shall include the name of the organisation, its address, and the approval reference.</p> <p>(6) (a) operations with any defective instrument or piece of equipment or item or function, under a minimum equipment list (MEL) (points ORO.MLR.105 (b), (f), and (j), NCC.IDE.A.105, NCC.IDE.H.105, SPO.IDE.A.105, and SPO.IDE.H.105).</p>

(b) operations requiring prior authorisation or approval, including all of the following:

- for specialised operations, wet lease-in and dry lease-in of aircraft registered in a third country (point ORO.SPO.100 (c));
- high-risk commercial specialised operations (point ORO.SPO.110);
- non-commercial operations with aircraft with an MOPSC of more than 19, which are performed without an operating cabin crew member (point ORO.CC.100 (d));
- use of IFR operating minima that are lower than those published by the State (points NCC.OP.110 and SPO.OP.110);
- refuelling with engine(s) and/or rotors turning (points NCC.OP.157 and SPO.OP.157);
- specialised operations (SPO) without oxygen above 10 000 ft (point SPO.OP.195).

⁽⁷⁾ operations in accordance with Annex V (Part-SPA) to Regulation (EU) No 965/2012, including Subparts B 'PERFORMANCE-BASED NAVIGATION (PBN) OPERATIONS', C 'OPERATIONS WITH SPECIFIED MINIMUM NAVIGATION PERFORMANCE (MNPS)', D 'OPERATIONS IN AIRSPACE WITH REDUCED VERTICAL SEPARATION MINIMA (RVSM)', E 'LOW VISIBILITY OPERATIONS (LVO)', G 'TRANSPORT OF DANGEROUS GOODS', K 'HELICOPTER OFFSHORE OPERATIONS', and M 'ELECTRONIC FLIGHT BAGS (EFBs)'.

Amendments to Annex IV ‘COMMERCIAL AIR TRANSPORT OPERATIONS’
(Part-CAT) to Commission Regulation (EU) No 965/2012

6. Point CAT.OP.MPA.100 (b)(3) is amended as follows:

CAT.OP.MPA.100 Use of air traffic services
‘(3) local helicopter operations (LHOs),’.
7. Point CAT.OP.MPA.106 ‘Use of isolated aerodromes — aeroplanes’ is deleted.
8. Point CAT.OP.MPA.150 ‘Fuel policy’ is deleted and replaced by the following:

‘CAT.OP.MPA.150
INTENTIONALLY LEFT BLANK’.
9. Point CAT.OP.MPA.151 ‘Fuel policy — alleviations’ is deleted.
10. Point CAT.OP.MPA.175 (b)(7), is amended as follows:

CAT.OP.MPA.175 Flight preparation
‘(7) the provisions specified in the operations manual in respect of fuel/energy, oil, oxygen, minimum safe altitudes, aerodrome operating minima and availability of alternate aerodromes, where required, can be complied with for the planned flight;’.
11. The following point CAT.OP.MPA.177 is inserted:

‘CAT.OP.MPA.177 Submission of the ATS flight plan
(a) If an air traffic services (ATS) flight plan is not submitted because it is not required by the rules of the air, adequate information shall be deposited in order to permit alerting services to be activated if required.
(b) When operating from a site where it is impossible to submit an ATS flight plan, the ATS flight plan shall be transmitted as soon as possible after take-off by the commander or the operator.’.
12. Point CAT.OP.MPA.180 is replaced by the following:

‘CAT.OP.MPA.180 Fuel/energy scheme — aeroplanes
(a) The operator shall establish, implement, and maintain a fuel/energy scheme that:

- (1) is appropriate for the type(s) of operation performed;
 - (2) corresponds to the capability of the operator to support its implementation;
and
 - (3) is either:
 - (i) a basic fuel scheme, which shall form the basis for a basic fuel scheme with variations and an individual fuel scheme; the basic fuel scheme derives from a large-scale analysis of safety and operational data from previous performance and experience of the industry, applying scientific principles; the basic fuel scheme shall ensure, in this order, a safe, effective, and efficient operation of the aircraft; or
 - (ii) a basic fuel scheme with variations, which is a basic fuel scheme where the above analysis is used to establish a variation to the basic fuel scheme that ensures a safe, effective, and efficient operation of the aircraft; or
 - (iii) an individual fuel scheme, which derives from a comparative analysis of the operator's safety and operational data, applying scientific principles; the analysis is used to establish a fuel scheme with a higher or equivalent level of safety to that of the basic fuel scheme that ensures a safe, effective, and efficient operation of the aircraft.
- (b) All fuel/energy schemes shall comprise:
- (1) a fuel/energy planning and in-flight replanning policy;
 - (2) an aerodrome selection policy; and
 - (3) an in-flight fuel/energy management policy.
- (c) The fuel/energy scheme and any change to it shall require prior approval by the competent authority.
- (d) When the operator intends to apply for an individual fuel/energy scheme, it shall:
- (1) establish a baseline safety performance of its current fuel/energy scheme;
 - (2) demonstrate its capability to support the implementation of the proposed individual fuel/energy scheme, including the capability to exercise adequate operational control and to ensure exchange of the relevant safety information between the operational control personnel and the flight crew;
and
 - (3) make a safety risk assessment that demonstrates how an equivalent level of safety to that of the current fuel/energy scheme is achieved.'.

13. Point CAT.OP.MPA.181 is replaced by the following:

‘CAT.OP.MPA.181 Fuel/energy scheme — fuel/energy planning and in-flight replanning policy — aeroplanes

- (a) The operator shall:
 - (1) establish a fuel/energy planning and in-flight replanning policy as part of the fuel/energy scheme;
 - (2) ensure that the aeroplane carries a sufficient amount of usable fuel/energy to safely complete the planned flight and to allow for deviations from the planned operation;
 - (3) develop procedures for the above policy that shall be contained in the operations manual.
 - (4) ensure that the fuel/energy planning of the flight is based upon:
 - (i) current aircraft-specific data derived from a fuel/energy consumption monitoring system or, if not available;
 - (ii) data provided by the aeroplane manufacturer.
- (b) The operator shall ensure that the planning of flights includes the operating conditions under which the flight is to be conducted; the operating conditions shall include at least:
 - (1) aircraft fuel/energy consumption data;
 - (2) anticipated masses;
 - (3) anticipated meteorological conditions;
 - (4) the effects of deferred maintenance items and/or of configuration deviations;
 - (5) the expected departure and arrival routing and runways; and
 - (6) anticipated delays.
- (c) The operator shall ensure that the preflight 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 replanning, to landing at the destination aerodrome, taking into account the operating conditions of point (b);
 - (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 make 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 1 500 ft (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 that is calculated at holding speed at 1 500 ft (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 safely 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 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.
- (d) The operator shall ensure that in-flight replanning procedures for calculating the usable fuel/energy that is required when a flight proceeds along a route or to a destination aerodrome other than the ones originally planned include points (c)(2) to (c)(7).’.

14. Point CAT.OP.MPA.182 is replaced by the following:

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

- (a) At the planning stage, the operator shall ensure that once the flight has commenced, there is reasonable certainty that an aerodrome where a safe landing can be made will be available at the estimated time of use of that aerodrome.
- (b) At the planning stage, to allow for a safe landing in case of an abnormal or emergency situation after take-off, the operator shall select and specify in the operational flight plan a take-off alternate aerodrome if:
 - (1) either the meteorological conditions at the aerodrome of departure are below the operator’s established aerodrome landing minima for that operation; or
 - (2) it would be impossible to return to the aerodrome of departure for other reasons.
- (c) The take-off alternate aerodrome shall be located within a distance from the departure aerodrome that minimises the risk of exposure to potential abnormal or emergency situations. In selecting the take-off alternate aerodrome, the operator shall consider at least the following:
 - (1) actual and forecast meteorological conditions;
 - (2) availability and quality of the aerodrome infrastructure;
 - (3) navigation and landing capabilities of the aircraft in abnormal or emergency conditions, taking into account the redundancy of critical systems; and
 - (4) approvals held (e.g. extended range operations with two-engined aeroplanes (ETOPS), low visibility operation (LVO), etc.).
- (d) At the planning stage, for each instrument flight rules (IFR) flight, the operator shall select and specify in the operational and air traffic services (ATS) flight plans one or more aerodromes so that two safe-landing options are available during normal operation when:
 - (1) reaching the destination aerodrome; or
 - (2) reaching the point of no return, for isolated aerodrome operations; a flight to an isolated aerodrome shall not be continued past the point of no return to any available fuel/energy ERA aerodrome unless a current assessment of meteorological conditions, traffic, and other operational conditions indicates that a safe landing can be made at the destination aerodrome at the estimated time of use.

The operator shall obtain prior approval from the competent authority for the use of an isolated aerodrome as destination aerodrome.
- (e) The operator shall provide appropriate safety margins to flight planning to take into account a possible deterioration of the available forecast meteorological conditions at the estimated time of landing.

- (f) For each IFR flight, the operator shall ensure that sufficient means are available to navigate to and land at the destination aerodrome or at any destination alternate aerodrome in the event of loss of capability for the intended approach and landing operation. ʹ.

15. Point CAT.OP.MPA.185 is replaced by the following:

‘CAT.OP.MPA.185 Fuel/energy scheme — in-flight fuel/energy management policy — aeroplanes

- (a) The operator shall establish procedures for in-flight fuel/energy management that ensure:
 - (1) continual validation of the assumptions made during the planning stage (preflight and/or in-flight replanning);
 - (2) reanalysis and adjustment, if necessary;
 - (3) that the amount of usable fuel/energy remaining on board is protected and not less than the fuel/energy that is required to proceed to an aerodrome where a safe landing can be made; and
 - (4) relevant fuel data for the purpose of (1), (2), and (3) shall be recorded.
- (b) When unforeseen circumstances may result in landing at the destination aerodrome with less than the final reserve fuel/energy plus any:
 - (1) fuel/energy to proceed to an alternate aerodrome, if required; or
 - (2) fuel/energy required to proceed to an isolated aerodrome,the operator shall have procedures in place to require the commander to obtain delay information from a reliable source.
- (c) The commander shall advise air traffic control (ATC) of a ‘minimum fuel/energy’ state by declaring ‘MINIMUM FUEL’ when the commander has:
 - (1) committed to land at a specific aerodrome; and
 - (2) calculated that any change to the existing clearance to that aerodrome may result in landing with less than the planned final reserve fuel/energy.
- (d) The commander shall declare a situation of ‘fuel/energy emergency’ by broadcasting ‘MAYDAY MAYDAY MAYDAY FUEL’ when the usable fuel/energy that is calculated to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel/energy.’.

16. Point CAT.OP.MPA.186 ‘Planning minima for IFR flights — helicopters’ is deleted.

17. Point CAT.OP.MPA.190 is replaced by the following:

‘CAT.OP.MPA.190 Fuel/energy scheme — helicopters

- (a) The operator shall establish, implement, and maintain a fuel/energy scheme that comprises:
 - (1) a fuel/energy planning and in-flight replanning policy; and

- (2) an in-flight fuel/energy management policy.
- (b) The fuel/energy scheme shall:
 - (1) be appropriate for the type(s) of operation performed; and
 - (2) correspond to the capability of the operator to support its implementation.
- (c) The fuel/energy scheme and any change to it shall require prior approval by the competent authority.’.

18. The following point CAT.OP.MPA.191 is inserted:

‘CAT.OP.MPA.191 Fuel/energy scheme — Fuel/energy planning and in-flight replanning policy — helicopters

- (a) As part of the fuel/energy scheme, the operator shall establish a fuel/energy planning and in-flight replanning policy to ensure that the aircraft carries a sufficient amount of usable fuel/energy to safely complete the planned flight and to allow for deviations from the planned operation.
- (b) The operator shall ensure that the fuel/energy planning of flights is based upon at least the following elements:
 - (1) procedures contained in the operations manual as well as:
 - (i) current aircraft-specific data derived from a fuel/energy consumption monitoring system; or
 - (ii) data provided by the aircraft manufacturer; and
 - (2) the operating conditions under which the flight is to be conducted including:
 - (i) aircraft fuel/energy consumption data;
 - (ii) anticipated masses;
 - (iii) anticipated meteorological conditions;
 - (iv) the effects of deferred maintenance items and/or of configuration deviations; and
 - (v) procedures and restrictions introduced by air navigation service providers.
- (c) The operator shall ensure that the preflight calculation of the usable fuel/energy that is required for a flight includes:
 - (1) taxi fuel/energy, which shall not be less than the amount expected to be used prior to take-off;
 - (2) trip fuel/energy;
 - (3) contingency fuel/energy;

- (4) destination alternate fuel/energy if a destination alternate aerodrome is required;
 - (5) final reserve fuel/energy, which shall not be less than:
 - (i) if flying under visual flight rules (VFR) and navigating by day with reference to visual landmarks, 20-minute fuel/energy at best-range speed; or
 - (ii) if flying under VFR and navigating by means other than by reference to visual landmarks or at night, 30-minute fuel/energy at best-range speed; or
 - (iii) if flying under instrument flight rules (IFR), 30-minute fuel/energy at holding speed at 1 500 ft (450 m) above the aerodrome elevation in standard conditions, calculated according to the helicopter estimated mass on arrival at the destination alternate aerodrome or at the destination aerodrome when no destination alternate aerodrome is required;
 - (6) extra fuel/energy, to take into account anticipated delays or specific operational constraints; and
 - (7) discretionary fuel/energy, if required by the commander.
- (d) The operator shall ensure that if a flight has to proceed along a route or to a destination aerodrome other than the ones originally planned, in-flight replanning procedures for calculating the required usable fuel/energy include:
- (1) trip fuel/energy for the remainder of the flight;
 - (2) reserve fuel/energy consisting of:
 - (i) contingency fuel/energy;
 - (ii) alternate fuel/energy if a destination alternate aerodrome is required;
 - (iii) final reserve fuel/energy; and
 - (iv) additional fuel/energy, if required by the type of operation;
 - (3) extra fuel/energy, to take into account anticipated delays or specific operational constraints; and
 - (4) discretionary fuel/energy, if required by the commander.
- (e) As an alternative to points (b) to (d) above, for helicopters with a maximum certified take-off mass (MCTOM) of 3 175 kg or less, flying by day and over routes navigated by reference to visual landmarks, or for local helicopter operations (LHO), the fuel/energy policy shall ensure that on completion of the flight, or series of flights, the final reserve fuel/energy is sufficient for:
- (1) 30-minute flying time at best-range speed; or

- (2) 20-minute flying time at best-range speed, if operating within an area providing continuous and suitable operating sites.’.

19. The following point CAT.OP.MPA.192 is inserted:

‘CAT.OP.MPA.192 Selection of aerodromes and operating sites — helicopters

- (a) For flights under instrument meteorological conditions (IMC), the operator shall select a take-off alternate aerodrome within one hour flying time at normal cruising speed if it is not possible to return to the site of departure for meteorological reasons.
- (b) At the planning stage, for each instrument flight rules (IFR) flight, the operator shall select and specify in the operational and air traffic services (ATS) flight plans one or more aerodromes or operating sites so that two safe-landing options are available during normal operation, except as provided for under point SPA.HOFO.120 (b).
- (c) The operator shall apply appropriate safety margins to flight planning to take into account a possible deterioration of the available forecast meteorological conditions at the estimated time of landing.
- (d) For each IFR flight, the operator shall ensure that sufficient means are available to navigate to and land at the destination aerodrome or at any destination alternate aerodrome in the event of loss of capability for the intended approach and landing operation.’.

20. Point CAT.OP.MPA.195 is replaced by the following:

‘CAT.OP.MPA.195 Fuel/energy scheme — in-flight fuel/energy management policy — helicopters

- (a) The operator shall establish procedures to ensure that in-flight fuel/energy checks and fuel/energy management are performed.
- (b) The commander shall monitor the amount of usable fuel/energy remaining on board to ensure that it is protected and not less than the fuel/energy that is required to proceed to an aerodrome or operating site where a safe landing can be made.
- (c) The commander shall advise air traffic control (ATC) of a ‘minimum fuel/energy’ state by declaring ‘MINIMUM FUEL’ when the commander has:
 - (1) committed to land at an aerodrome or operating site; and
 - (2) calculated that any change to the existing clearance to that aerodrome or operating site, or other air traffic delays, may result in landing with less than the planned final reserve fuel/energy.

- (d) The commander shall declare a situation of ‘fuel/energy emergency’ by broadcasting ‘MAYDAY MAYDAY MAYDAY FUEL’ when the usable fuel/energy estimated to be available upon landing at the nearest aerodrome or operating site where a safe landing can be made is less than the planned final reserve fuel/energy.’.

21. The following point CAT.OP.MPA.200 is inserted:

‘CAT.OP.MPA.200 Special refuelling or defuelling of the aircraft

- (a) Special refuelling or defuelling shall only be conducted if the operator:
 - (1) has performed a risk assessment;
 - (2) has developed procedures; and
 - (3) has established a training programme for its personnel involved in such operations.
- (b) Special refuelling or defuelling applies to:
 - (1) refuelling with an engine running or rotors turning;
 - (2) refuelling/defuelling with passengers embarking, on board, or disembarking; and
 - (3) refuelling/defuelling with wide-cut fuel.
- (c) For aeroplanes, any special refuelling or defuelling procedures and any change to them shall require prior approval by the competent authority.
- (d) For helicopters, refuelling procedures with rotors turning and any change to them shall require prior approval by the competent authority.’.

22. Point CAT.OP.MPA.245 (a)(1) is amended as follows:

CAT.OP.MPA.245 Meteorological conditions — all aircraft

- ‘(1) commence the flight; or’.

23. Point CAT.OP.MPA.246 (a) is amended as follows:

‘CAT.OP.MPA.246 Meteorological conditions — aeroplanes

- ‘(a) the decision point when using the reduced contingency fuel/energy procedure; or’.

24. Point CAT.OP.MPA.260 is amended as follows:

‘CAT.OP.MPA.260 Fuel/energy and oil supply

The commander shall only commence a flight or continue in the event of in-flight replanning, when satisfied that the aircraft carries at least the planned amount of usable

fuel/energy and oil to complete the flight safely, taking into account the expected operating conditions.’.

25. Point CAT.OP.MPA.280 ‘In-flight fuel management — aeroplanes’ is deleted and replaced by the following:

‘CAT.OP.MPA.280
INTENTIONALLY LEFT BLANK’.

26. Point CAT.OP.MPA.281 ‘In-flight fuel management — helicopters’ is deleted.

27. Point CAT.POL.A.220 (f) is amended as follows:

CAT.POL.A.220 En route — aeroplanes with three or more engines, two engines inoperative

‘(f) The expected mass of the aeroplane at the point where the two engines are assumed to fail shall not be less than that which would include sufficient fuel/energy to proceed to an aerodrome where the landing is assumed to be made, and to arrive there at an altitude of at least 1 500 ft (450 m) directly over the landing area, and thereafter, to fly for 15 minutes at cruising power or thrust, as appropriate.’.

28. Point CAT.POL.A.420 (d) is amended as follows:

CAT.POL.A.420 En route — aeroplanes with three or more engines, two engines inoperative

‘(d) The expected mass of the aeroplane at the point where the two engines are assumed to fail shall not be less than that which would include sufficient fuel/energy to proceed to an aerodrome where the landing is assumed to be made, and to arrive there at an altitude of at least 1 500 ft (450 m) directly over the landing area, and thereafter, to fly for 15 minutes at cruising power or thrust, as appropriate.’.

29. Point CAT.IDE.A.195 (e) is amended as follows:

CAT.IDE.A.195 Data link recording

‘(e) The requirements applicable to the start and stop logic of the data link recorder are the same as the requirements applicable to the start and stop logic of the cockpit voice recorder (CVR) that are contained in point CAT.IDE.A.185.’.

Amendments to Annex V ‘SPECIFIC APPROVALS’ (Part-SPA) to Commission Regulation
(EU) No 965/2012

30. Point SPA.HEMS.150 is amended as follows:

‘SPA.HEMS.150 Fuel/energy supply — alleviation

As an alternative to points CAT.OP.MPA.191 (b), (c), and (d), when the helicopter emergency medical services (HEMS) mission is conducted under visual flight rules (VFR) within a local and defined geographical area, the fuel/energy policy shall ensure that on completion of the mission, the final reserve fuel/energy is sufficient for:

- (a) 30-minute flying time at best-range speed; or
- (b) 20-minute flying time at best-range speed by day, when operating within an area providing continuous and suitable operating sites.’.

31. Point SPA.HEMS.155 is replaced by the following:

‘SPA.HEMS.155 Refuelling with passengers on board

A refuelling procedure with either rotors stopped or rotors turning shall be provided in accordance with point CAT.OP.MPA.200 ‘Special refuelling or defuelling of the aircraft’.

32. Point SPA.HOFO.120 (a) is amended as follows:

SPA.HOFO.120 Selection of aerodromes and operating sites

‘(a) *Onshore destination alternate aerodrome.* By way of derogation from points CAT.OP.MPA.192, NCC.OP.152, and SPO.OP.151, the pilot-in-command/commander does not need to specify a destination alternate aerodrome in the operational flight plan when conducting flights from an offshore location to a land aerodrome if either:

- (1) the destination aerodrome is defined as a coastal aerodrome, or
- (2) the following criteria are met:
 - (i) the destination aerodrome has a published instrument approach;
 - (ii) the flight time is less than 3 hours; and
 - (iii) the published weather forecast valid from 1 hour prior and 1 hour subsequent to the expected landing time specifies that:
 - (A) the cloud base is at least 700 feet above the minima associated with the instrument approach, or 1 000 feet above the destination aerodrome, whichever is higher; and
 - (B) visibility is at least 2 500 meters.’.

33. Point SPA.SET-IMC.110 (l) is amended as follows:

SPA.SET-IMC.110 Equipment requirements for SET-IMC operations

- ‘(l) an emergency engine power control device that permits continuing operation of the engine at a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel/energy control unit.’

Amendments to Annex VI ‘NON-COMMERCIAL AIR OPERATIONS WITH COMPLEX
MOTOR-POWERED AIRCRAFT’ (Part-NCC) to Commission Regulation (EU)
No 965/2012

34. Point NCC.OP.105 is amended as follows:

‘NCC.OP.105 Specification of isolated aerodromes — aeroplanes

For the selection of alternate aerodromes and the fuel/energy planning and in-flight replanning policy, the operator shall not consider an aerodrome as an isolated aerodrome unless the flying time to the nearest weather-permissible destination alternate aerodrome is more than:

- (a) for aeroplanes with reciprocating engines, 60 minutes; or
- (b) for turbine-engined aeroplanes, 90 minutes.’.

35. Point NCC.OP.130 ‘Fuel and oil supply — aeroplanes’ is deleted and replaced by the following:

‘NCC.OP.130 Fuel/energy scheme — aeroplanes and helicopters

- (a) The operator shall establish, implement, and maintain a fuel/energy scheme that comprises:
 - (1) a fuel/energy planning and in-flight replanning policy; and
 - (2) an in-flight fuel/energy management policy.
- (b) The fuel/energy scheme shall:
 - (1) be appropriate for the type(s) of operation performed; and
 - (2) correspond to the capability of the operator to support its implementation.’.

36. Point NCC.OP.131 ‘Fuel and oil supply — helicopters’ is deleted and replaced by the following:

‘NCC.OP.131 Fuel/energy scheme — fuel/energy planning and in-flight replanning policy — aeroplanes and helicopters

- (a) As part of the fuel/energy scheme, the operator shall establish a fuel/energy planning and in-flight replanning policy to ensure that the aircraft carries a sufficient amount of usable fuel/energy to safely complete the planned flight and to allow for deviations from the planned operation.
- (b) The operator shall ensure that the fuel/energy planning of flights is based upon at least the following elements:
 - (1) procedures contained in the operations manual as well as:

- (i) current aircraft-specific data derived from a fuel/energy consumption monitoring system, or, if not available;
 - (ii) data provided by the aircraft manufacturer; and
- (2) the operating conditions under which the flight is to be conducted including:
 - (i) aircraft fuel/energy consumption data;
 - (ii) anticipated masses;
 - (iii) anticipated meteorological conditions;
 - (iv) the effects of deferred maintenance items and/or configuration deviations; and
 - (v) anticipated delays.
- (c) For aeroplanes, the operator shall ensure that the preflight 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 replanning, to landing at the destination aerodrome, taking into account the operating conditions of point (b);
 - (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 to compensate for the lack of a destination alternate aerodrome;
 - (5) final reserve fuel/energy that shall be the amount of fuel that is calculated at holding speed at 1 500 ft (450 m) above the aerodrome elevation in standard conditions according to the aircraft 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 on visual flight rules (VFR) flights by night and instrument flight rules (IFR) flights, the fuel/energy to fly for 45 minutes; or

- (ii) for aeroplanes with reciprocating engines on VFR flights by day, the fuel/energy to fly for 30 minutes;
- (iii) 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 safely land at a fuel/energy en route alternate aerodrome (fuel/energy ERA aerodrome critical scenario) in the event of an engine failure or loss of pressurisation, whichever requires the greater amount of fuel/energy, based on the assumption that such a failure occurs 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.
- (d) For helicopters, the operator shall ensure that the preflight calculation of the usable fuel/energy that is required for a flight includes all of the following:
 - (1) fuel/energy to fly to the aerodrome or operating site of intended landing;
 - (2) if a destination alternate is required, destination alternate fuel/energy, which shall be the amount of fuel/energy that is required to execute a missed approach at the aerodrome or operating site of intended landing, and thereafter, to fly to the specified destination alternate, approach and land; and
 - (3) final reserve fuel/energy, which shall not be less than:
 - (i) for flights under VFR, fuel to fly for at least 20 minutes at best-range speed; or
 - (ii) for IFR flights, fuel to fly for at least 30 minutes at holding speed at 450 m (1 500 ft) above the aerodrome or operating site of intended landing or destination alternate in standard temperature conditions.
- (e) The operator shall ensure that if a flight has to proceed to a destination aerodrome other than the one originally planned, in-flight replanning procedures for calculating the required usable fuel/energy are available and comply with points (c)(2) to (c)(7) for aeroplanes, and point (d) for helicopters.’.

37. Point NCC.OP.151 (b) is amended as follows:

NCC.OP.151 Destination alternate aerodromes — aeroplanes

‘(b) the place of intended landing is designated as an isolated aerodrome and:’.

38. Point NCC.OP.155 (b) is amended as follows:

NCC.OP.155 Refuelling with passengers embarking, on board or disembarking

‘(b) For all other types of fuel/energy, necessary precautions shall be taken and the aircraft shall be properly manned by qualified personnel ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available.’.

39. The following point NCC.OP.157 is inserted:

‘NCC.OP.157 Refuelling with engine(s) and/or rotors turning — helicopters

- (a) Refuelling with engine(s) and/or rotors turning shall only be conducted:
- (1) with no passengers embarking or disembarking;
 - (2) if the operator of the aerodrome/operating site allows such operations;
 - (3) in accordance with any specific procedures and limitations in the aircraft flight manual (AFM);
 - (4) with JET A or JET A-1 fuel types; and
 - (5) in the presence of the appropriate rescue and firefighting (RFF) facilities or equipment.
- (b) The operator shall assess the risks associated with refuelling with engine(s) and/or rotors turning.
- (c) The operator shall establish appropriate procedures to be followed by all involved personnel, such as crew members and ground operations personnel.
- (d) The operator shall train its crew members and ensure that the involved ground operations personnel is trained appropriately.
- (e) The operator shall ensure that the helicopter refuelling procedure with engine(s) and/or rotors turning are specified in the operations manual. This procedure and any change thereto shall require prior approval by the competent authority.’.

40. Point NCC.OP.205 is amended as follows:

‘NCC.OP.205 Fuel/energy scheme — in-flight fuel/energy management policy

- (a) The operator shall establish procedures to ensure that in-flight fuel/energy checks and fuel/energy management are performed.
- (b) The pilot-in-command shall monitor the amount of usable fuel/energy remaining on board to ensure that it is protected and not less than the fuel/energy that is required to proceed to an aerodrome or operating site where a safe landing can be made.

- (c) The pilot-in-command shall advise air traffic control (ATC) of a ‘minimum fuel/energy’ state by declaring ‘MINIMUM FUEL’ when the pilot-in-command has:
 - (1) committed to land at a specific aerodrome or operating site; and
 - (2) calculated that any change to the existing clearance to that aerodrome or operating site, or other air traffic delays, may result in landing with less than the planned final reserve fuel/energy.
- (d) The pilot-in-command shall declare a situation of ‘fuel/energy emergency’ by broadcasting ‘MAYDAY MAYDAY MAYDAY FUEL’ when the usable fuel/energy estimated to be available upon landing at the nearest aerodrome or operating site where a safe landing can be made is less than the planned final reserve fuel/energy.’.

41. Points NCC.POL.110 (a)(6) to (a)(9) are amended as follows:

NCC.POL.110 Mass and balance data and documentation

- ‘(6) mass of the fuel/energy at take-off and mass of trip fuel/energy;
- (7) mass of consumables other than fuel/energy, if applicable;
- (8) load components including passengers, baggage, freight, and ballast;
- (9) take-off mass, landing mass, and zero fuel/energy mass;’.

Amendments to Annex VII ‘NON-COMMERCIAL AIR OPERATIONS WITH OTHER-
THAN COMPLEX MOTOR-POWERED AIRCRAFT’ (Part-NCO) to Commission
Regulation (EU) No 965/2012

42. Point NCO.OP.105 is amended as follows:

NCO.OP.105 Specification of isolated aerodromes — aeroplanes

‘For the selection of alternate aerodromes and the fuel/energy supply, the pilot-in-command shall not consider an aerodrome as an isolated aerodrome unless the flying time to the nearest weather-permissible destination alternate aerodrome is more than:

- (a) for aeroplanes with reciprocating engines, 60 minutes; or
- (b) for turbine-engined aeroplanes, 90 minutes.’.

43. Point NCO.OP.125 ‘Fuel and oil supply — aeroplanes’ is deleted and replaced by the following:

‘NCO.OP.125 Fuel/energy and oil supply — aeroplanes and helicopters

- (a) The pilot-in-command shall ensure that the quantity of fuel/energy and oil that is carried on board is sufficient, taking into account the meteorological conditions, any element affecting the performance of the aircraft, any delays that are expected in flight, and any contingencies that may reasonably be expected to affect the flight.
- (b) The pilot-in-command shall plan a quantity of fuel/energy to be protected as final reserve fuel/energy to ensure a safe landing. The pilot-in-command shall take into account all of the following, and in the following order of priority, to determine the quantity of the final reserve fuel/energy:
 - (1) the severity of the hazard to persons or property that may result from an emergency landing after fuel/energy starvation; and
 - (2) the likelihood of unexpected circumstances that the final reserve fuel/energy may no longer be protected.
- (c) The pilot-in-command shall commence a flight only if the aircraft carries sufficient fuel/energy and oil:
 - (1) when no destination alternate is required, to fly to the aerodrome or operating site of intended landing, plus the final reserve fuel/energy; or
 - (2) when a destination alternate is required, to fly to the aerodrome or operating site of intended landing, and thereafter, to an alternate aerodrome, plus the final reserve fuel/energy.’.

44. Point NCO.OP.126 'Fuel and oil supply — helicopters' is deleted.

45. Point NCO.OP.145 (b) is amended as follows:

NCO.OP.145 Refuelling with passengers embarking, on board or disembarking

'(b) For all other types of fuel/energy, the aircraft shall not be refuelled when passengers are embarking, on board or disembarking, unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available.'

46. The following point NCO.OP.147 is inserted:

'NCO.OP.147 Refuelling with engine(s) and/or rotors turning — helicopters

Refuelling with engine(s) and/or rotors turning shall only be conducted:

- (a) if it is not practical to shut down or restart the engine;
- (b) in accordance with any specific procedures and limitations in the aircraft flight manual (AFM);
- (c) with JET A or JET A-1 fuel types;
- (d) with no passengers or task specialists on board, embarking or disembarking;
- (e) if the operator of the aerodrome or operating site allows such operations;
- (f) in the presence of the appropriate rescue and firefighting (RFF) facilities or equipment; and
- (g) in accordance with a checklist that shall contain:
 - (1) normal and contingency procedures;
 - (2) the required equipment;
 - (3) any limitations; and
 - (4) responsibilities and duties of the pilot-in-command and, if applicable, crew members and task specialists.'

47. Point NCO.OP.185 is amended as follows:

'NCO.OP.185 In-flight fuel/energy management

- (a) The pilot-in-command shall monitor the amount of usable fuel/energy remaining on board to ensure that it is protected and not less than the fuel/energy that is required to proceed to an aerodrome or operating site where a safe landing can be made.

- (b) The pilot-in-command of a controlled flight shall advise air traffic control (ATC) of a 'minimum fuel/energy' state by declaring 'MINIMUM FUEL' when the pilot-in-command has:
 - (1) committed to land at a specific aerodrome or operating site; and
 - (2) calculated that any change to the existing clearance to that aerodrome or operating site, or other air traffic delays, may result in landing with less than the planned final reserve fuel/energy.
- (c) The pilot-in-command of a controlled flight shall declare a situation of 'fuel/energy emergency' by broadcasting 'MAYDAY MAYDAY MAYDAY FUEL' when the usable fuel/energy estimated to be available upon landing at the nearest aerodrome or operating site where a safe landing can be made is less than the planned final reserve fuel/energy.'.

48. Point NCO.SPEC.135 'Fuel and oil supply — aeroplanes' is deleted.

49. Point NCO.SPEC.140 'Fuel and oil supply — helicopters' is deleted.

Amendments to Annex VIII ‘SPECIALISED OPERATIONS’ (Part-SPO) to Commission
Regulation (EU) No 965/2012

50. Point SPO.OP.105 is amended as follows:

SPO.OP.105 Specification of isolated aerodromes — aeroplanes

For the selection of alternate aerodromes and the fuel/energy planning and in-flight replanning policy, the operator shall not consider an aerodrome as an isolated aerodrome unless the flying time to the nearest weather-permissible destination alternate aerodrome is more than:

- (a) for aeroplanes with reciprocating engines, 60 minutes; or
- (b) for turbine-engined aeroplanes, 90 minutes.

51. Point SPO.OP.130 ‘Fuel and oil supply — aeroplanes’ is deleted and replaced by the following:

‘SPO.OP.130 Fuel/energy scheme — aeroplanes and helicopters

- (a) The operator shall establish, implement, and maintain a fuel/energy scheme that comprises:
 - (1) a fuel/energy planning and in-flight replanning policy; and
 - (2) an in-flight fuel/energy management policy.
- (b) The fuel/energy scheme shall:
 - (1) be appropriate for the type(s) of operation performed; and
 - (2) correspond to the capability of the operator to support its implementation.

52. Point SPO.OP.131 ‘Fuel and oil supply — helicopters’ is deleted and replaced by the following:

‘SPO.OP.131 Fuel/energy scheme — fuel/energy planning and in-flight replanning policy — aeroplanes and helicopters

- (a) As part of the fuel/energy scheme, the operator shall establish a fuel/energy planning and in-flight replanning policy to ensure that the aircraft carries a sufficient amount of usable fuel/energy to safely complete the planned flight and to allow for deviations from the planned operation.
- (b) The operator shall ensure that the fuel/energy planning of flights is based upon at least the following elements:
 - (1) procedures contained in the operations manual as well as:
 - (i) current aircraft-specific data derived from a fuel/energy consumption monitoring system or, if not available;

- (ii) data provided by the aircraft manufacturer; and
- (2) the operating conditions under which the flight is to be conducted including:
 - (i) aircraft fuel/energy consumption data;
 - (ii) anticipated masses;
 - (iii) anticipated meteorological conditions;
 - (iv) the effects of deferred maintenance items and/or configuration deviations; and
 - (v) anticipated delays.
- (c) For aeroplanes, the operator shall ensure that the preflight 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 replanning, to landing at the destination aerodrome, taking into account the operating conditions of point (b);
 - (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 to compensate for the lack of a destination alternate aerodrome;
 - (5) final reserve fuel/energy that shall be protected to ensure a safe landing; the operator shall take into account all of the following, and in the following order of priority, to determine the quantity of the final reserve fuel/energy:
 - (i) the severity of the hazard to persons or property that may result from an emergency landing after fuel/energy starvation;
 - (ii) the likelihood of unexpected circumstances that the final reserve fuel/energy may no longer be protected;
 - (6) additional fuel/energy, if required by the type of operation; it shall be the amount of fuel/energy to enable the aeroplane to safely land at a fuel/energy en route alternate aerodrome (fuel/energy ERA aerodrome critical scenario)

in the event of an engine failure or loss of pressurisation, whichever requires the greater amount of fuel/energy, based on the assumption that such a failure occurs 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 pilot-in-command.
- (d) For helicopters, the operator shall ensure that the preflight calculation of the usable fuel/energy that is required for a flight includes all of the following:
- (1) fuel/energy to fly to the aerodrome or operating site of intended landing;
 - (2) if a destination alternate is required, destination alternate fuel/energy, which shall be the amount of fuel/energy that is required to execute a missed approach at the aerodrome or operating site of intended landing, and thereafter, to fly to the specified destination alternate, approach and land; and
 - (3) final reserve fuel/energy, which shall be protected to ensure a safe landing; the operator shall take into account all of the following, and in the following order of priority, to determine the quantity of the final reserve fuel/energy:
 - (i) the severity of the hazard to persons or property that may result from an emergency landing after fuel/energy starvation; and
 - (ii) the likelihood of such unexpected circumstances that the final reserve fuel/energy may no longer be protected;
 - (4) extra fuel/energy to take into account anticipated delays or specific operational constraints; and
 - (5) discretionary fuel/energy, if required by the pilot-in-command.
- (e) The operator shall ensure that, if a flight has to proceed to a destination aerodrome other than the one originally planned, in-flight replanning procedures for calculating the required usable fuel/energy are available and comply with points (c)(2) to (c)(7) for aeroplanes, and point (d) for helicopters.’.

53. Point SPO.OP.150 (b) is amended as follows:

SPO.OP.150 Destination alternate aerodromes — aeroplanes

‘(b) the place of intended landing is designated as an isolated aerodrome and:’.

54. Point SPO.OP.155 (b) is amended as follows:

SPO.OP.155 Refuelling with persons embarking, on board or disembarking

‘(b) For all other types of fuel/energy, necessary precautions shall be taken and the aircraft shall be properly manned by qualified personnel ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available.’.

55. The following point SPO.OP.157 is inserted:

‘SPO.OP.157 Refuelling with engine(s) and/or rotors turning — helicopters

- (a) Refuelling with engine(s) and/or rotors turning shall only be conducted:
- (1) with no task specialists embarking or disembarking;
 - (2) if the operator of the aerodrome or operating site allows such operations;
 - (3) in accordance with any specific procedures and limitations in the aircraft flight manual (AFM);
 - (4) with JET A or JET A-1 fuel types; and
 - (5) in the presence of the appropriate rescue and firefighting (RFF) facilities or equipment.
- (b) The operator shall assess the risks associated with refuelling with engine(s) and/or rotors turning.
- (c) The operator shall establish appropriate procedures to be followed by all involved personnel, such as crew members, task specialists, and ground operations personnel.
- (d) The operator shall ensure that its crew members, ground operations personnel, as well as any task specialist involved in the procedures, are appropriately trained.
- (e) The operator shall ensure that the helicopter refuelling procedures with engine(s) and/or rotors turning are specified in the operations manual.’.

56. Point SPO.OP.190 is amended as follows:

‘SPO.OP.190 Fuel/energy scheme — in-flight fuel/energy management policy

- (a) The operator of complex motor-powered aircraft shall establish procedures to ensure that in-flight fuel/energy checks and fuel/energy management are performed.
- (b) The pilot-in-command shall monitor the amount of usable fuel/energy remaining on board to ensure that it is protected and not less than the fuel/energy that is required to proceed to an aerodrome or operating site where a safe landing can be made.

- (c) The pilot-in-command shall advise air traffic control (ATC) of a ‘minimum fuel/energy’ state by declaring ‘MINIMUM FUEL’ when the pilot-in-command has:
 - (1) committed to land at a specific aerodrome or operating site; and
 - (2) calculated that any change to the existing clearance to that aerodrome or operating site, or other air traffic delays, may result in landing with less than the planned final reserve fuel/energy.
- (d) The pilot-in-command shall declare a situation of ‘fuel/energy emergency’ by broadcasting ‘MAYDAY MAYDAY MAYDAY FUEL’ when the usable fuel/energy estimated to be available upon landing at the nearest aerodrome or operating site where a safe landing can be made is less than the planned final reserve fuel/energy.’.

57. Point SPO.POL.110 is amended as follows:

‘SPO.POL.110 Mass and balance system — commercial operations with aeroplanes and helicopters and non-commercial operations with complex motor-powered aircraft

- (a) The operator shall establish a mass and balance system to determine for each flight or series of flights the following:
 - (1) aircraft dry operating mass;
 - (2) mass of the traffic load;
 - (3) mass of the fuel/energy load;
 - (4) aircraft load and load distribution;
 - (5) take-off mass, landing mass, and zero fuel/energy mass; and
 - (6) applicable aircraft centre of gravity (CG) positions.
- (b) The flight crew shall be provided with a means of replicating and verifying any mass and balance computation based on electronic calculations.
- (c) The operator shall establish procedures to enable the pilot-in-command to determine the mass of the fuel/energy load by using the actual density or, if not known, the density calculated in accordance with a method specified in the operations manual.’.

58. Points SPO.POL.115 (a)(6) to (a)(9) are amended as follows:

SPO.POL.115 Mass and balance data and documentation — commercial operations with aeroplanes and helicopters and non-commercial operations with complex motor-powered aircraft

- ‘(6) mass of the fuel/energy at take-off and mass of trip fuel/energy;
- (7) mass of consumables other than fuel/energy, if applicable;

- (8) load components;
- (9) take-off mass, landing mass, and zero fuel/energy mass;’.

59. Point SPO.IDE.H.146 (a)(1) is amended as follows:

SPO.IDE.H.146 Lightweight flight recorder

‘(1) they are not within the scope of point SPO.IDE.H.145 (a);’.