NOTICE OF PROPOSED AMENDMENT 2018-05

Issue 01

Date of Issue: 25th December 2018

SUBJECT:
CAR-OPS 1 AMENDMENT

REASON:
The GCAA is considering amending its regulation to:

- incorporate changes related to First Aid Training;
- Single pilot operations under IFR or at night; and
- GNSS equipages, Aircraft in distress requirement, along with Aircraft Global Tracking.

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

~~Text to be deleted is shown with a line through it~~.	text to be deleted
New text to be inserted is highlighted with grey shading.	new text to be inserted
~~Text to be deleted is shown with a line through it~~ followed or proceed by the replacement text, which is highlighted with grey shading.	new text to replace existing text

RECOMMENDATION:

This NPA is published to announce to the public amendment proposals to CAR-OPS1 and to entitle all concerned parties to:

a) Review the attached proposed changes to regulation;

b) Agree on the date of applicability to the proposed change set to 1th June 2019; and

c) Submit their comments on the changes and date of applicability online through the GCAA website by 1st March 2019.

Comments must be submitted through the GCAA Website – E-Publication – Notice of Proposed Amendment, using the Action of "Submit NPA Feedback Request". Any comments submitted using another means will not be considered.

Comments and Responses may be viewed in the Comments Response Document CRD pertaining to this NPA on the GCAA website.

CONTACT:
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PROPOSED AMENDMENT
CAR-OPS 1

PROPOSAL 1: CAR-OPS1 – Emergency Medical Services

---- START PROPOSAL 1 ----

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SUBPART K. INSTRUMENT AND EQUIPMENT

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CAR-OPS 1.745 First Aid Kits

(See AMC OPS 1.745)

(a) An operator shall not operate an aeroplane unless it is equipped with first-aid kits, readily accessible for use, to the following scale:

Number of passenger seats installed	Number of First-Aid Kits required
1 to 100	1
101 to 200	2
201 to 300	3
301 to 400	4
401 to 500	5
501 or more	6

AMC OPS 1.745 First-Aid Kits

See CAR-OPS 1.745

The following should be included in the First-Aid Kits, unless an alternative means of compliance has been approved by the Authority:

- Ground/Air visual signal code for use by survivors (may be contained in / as separate kit).
- Antiseptic swabs (10/pack)
- Bandage: adhesive strips
- Bandage: gauze 7.5 cm × 4.5 m
- Bandage: triangular; safety pins
- Dressing: burn 10 cm × 10 cm
- Dressing: compress, sterile 7.5 cm × 12 cm
- Dressing: gauze, sterile 10.4 cm × 10.4 cm
- Tape: adhesive 2.5 cm (roll)
- Disposable resuscitation aid
- Simple analgesic e.g. paracetamol
- First-Aid handbook
- Gastrointestinal Antacid +
- Anti-diarrheal medication e.g. Loperamide +

- Steri-strips (or equivalent adhesive strip)
- Hand cleanser or cleansing towelettes
- Pad with shield, or tape, for eye
- Scissors: 10 cm
- Tape: Adhesive, surgical 1.2 cm × 4.6 m
- Tweezers: splinter
- Disposable gloves (multiple pairs)
- Thermometers (non-mercury)
- Mouth-to-mouth resuscitation mask with one-way valve
- First-aid manual, current edition
- Incident record form
- Mild to moderate analgesic
- Antiemetic
- Nasal decongestant
- Antacid
- Antihistamine

A list of contents in at least 2 languages (English and one other). This should include information on the effects and side effects of drugs carried.

NOTE: An eye irrigator whilst not required to be carried in the first-aid kit should, where possible, be available for use on the ground.

\+ For aeroplanes with more than 9 passenger seats installed.

GM OPS 1.745 & OPS 1.755 First-Aid Kits/Emergency Medical Kit (Risk Assessment)

An alternative means of compliance may be approved by the Authority following the establishment of a risk assessment conducted by the operator.

The risk assessment should include at least the following:

a) Determination of the safety criteria applicable to the introduction or removal of an item as required by the applicable AMC

b) Impact assessment of the product to be used

c) Training of the staff that will administer the product

d) Specific monitoring to ensure the new product has an equivalent level of safety

e) Risk evaluation and specific mitigation measures

CAR-OPS 1.746 Automated External Defibrillators

Operators shall establish an AED programme including the installation of AEDs to manage sudden cardiac arrest onboard their flights.

AMC1 OPS 1.746 Automated External Defibrillators

a) An AED program should:

(1) Be described;

(2) establish clearly defined lines of responsibility for those who oversee and monitor the program or participate in it;

(3) Assign a licensed physician for managing all medical aspects of the AED program and oversee the program's administration and coordination activities;

(4) Be integrated in the more general plan describing emergency responses;

(5) Include recognized and standarised training of all employees who are engaged in delivering first aid. Topics should include CPR and the use of the specific AED expected to be available and used at the aircraft

(6) Ensure selection of AEDs and ancillary supplies that meet local and federal legislation criteria for medical devices, and ensure they are regularly maintained as per the manufacturer's requirements.

b) AEDs should be conveniently installed and easily accessible to ensure response time within 3-5 minutes

c) AED should include:

Item No.	Product Description	Item Quantity
1	CPR mouth pieces	2
2	Adult AED with adult pads	1
3	Child AED with child pads	1
4	AED accessories (towel, razor,etc.)	1
5	Spare batteries for AED	1
6	1-way valve Adult mask	1
7	1-way valve Pediatric mask	1
8	Face shield	1

CAR-OPS 1.755 Emergency Medical Kit

(See AMC OPS 1.755)

(a) An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 30 seats unless it is equipped with an emergency medical kit if any point on the planned route is more than 60 minutes flying time (at normal cruising speed) from an aerodrome at which qualified medical assistance could be expected to be available.

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AMC OPS 1.755 Emergency Medical Kit

See CAR-OPS 1.755

The following should be included in the emergency medical kit carried in the aeroplane, unless an alternative means of compliance has been approved by the Authority:

MEDICAL KIT

— Stethoscope

— Sphygmomanometer (electronic preferred)
— Airways, oropharyngeal (three sizes)
— Syringes (appropriate range of sizes)
— Needles (appropriate range of sizes)
— Intravenous catheters (appropriate range of sizes)
— Antiseptic wipes
— Gloves (disposable)
— Needle disposal box
— Urinary catheter
— System for delivering intravenous fluids
— Venous tourniquet
— Sponge gauze
— Tape – adhesive
— Surgical mask
— Emergency tracheal catheter (or large gauge intravenous cannula)
— Umbilical cord clamp
— Thermometers (non-mercury)
— Basic life support cards
— Bag-valve mask
— Flashlight and batteries

MEDICATION

– Anti-spasmodic e.g. hyascene
– Medication for Hypoglycemia, hypertonic glucose and/or glucagon
– Digoxin
— Epinephrine 1:1 000
— Antihistamine – injectable
— Dextrose 50% (or equivalent) – injectable: 50 ml
— Nitroglycerin tablets or spray
— Major analgesic
— Sedative anticonvulsant – injectable
— Antiemetic – injectable
— Bronchial dilator – inhaler
— Atropine – injectable
— Adrenocortical steroid – injectable
— Diuretic – injectable
— Medication for postpartum bleeding
— Sodium chloride 0.9% (minimum 250 ml)
— Acetyl salicylic acid (aspirin) for oral use
— Oral beta-blocker

If a cardiac monitor is available (with or without an AED) add to the above list:
— Epinephrine 1:10 000 (can be a dilution of epinephrine 1:1 000)

A list of contents in at least 2 languages (English and one other). This should include information on the effects and side effects of psychoactive substances carried.

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SUBPART O. CABIN CREW …

CAR-OPS 1.1005 Initial training

(See Appendix 1 to CAR-OPS 1.1005)
(See Appendix 2 to CAR-OPS 1.1005/1.1010/1.1015)

(See Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015)
(See AC OPS 1.1005/1.1010/1.1015)
(See AC OPS 1.1005/1.1010/1.1015/1.1020)

An operator shall ensure that each cabin crew member successfully completes initial training.

The training programme must be approved by the Authority, in accordance with Appendix 1 to CAR-OPS 1.1005 and Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015, and the checking prescribed in CAR-OPS 1.1025 before undertaking conversion training.

An operator shall ensure that Initial Training or Conversion Training is conducted in a structured and realistic manner, in accordance with Appendix 1 to CAR-OPS 1.1005, Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015 and PART D of the Operations Manual required by CAR-OPS-1.1045;

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Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015 Medical Aspects and First Aid Training

(See Appendix 1 to CAR-OPS1.1005)
(See Appendix 1 to CAR-OPS1.1010)
(See Appendix 1 to CAR-OPS1.1015)
(See AC to Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015 Medical Aspects and First Aid Training)

(a) Medical aspects and first aid training shall include the following subjects:

(1) Aviation Physiology of flight including oxygen requirements and hypoxia;

(2) First Aid Response Process including Basic Management;

(3) Request for Medical Support;

(4) Use of Medical Kits and their contents on board the aircraft;

(5) Primary and Secondary Assessment;

(6) Personal Protective Equipment (PPE);

(7) Managing life threatening conditions:
- (i) Unconscious Not Breathing Casualty (CPR for Adult/Child infant with AED);
- (ii) Airway Problem (Choking Casualty);
- (iii) Breathing Difficulties;
- (iv) Severe Bleeding
- (v) Medical Shock

(8) Sudden Illness:
- (i) Chest Pain/Heart Attacks
- (ii) Asthma
- (iii) Rapid Breathing (Hyperventilation)
- (iv) Hypoxia

(v) Stroke
(vi) Seizure
(vii) Low Blood Sugar
(viii) Mild and Severe Allergic Reaction
(ix) Temporary loss of consciousness (Fainting)
(x) Drug overdose (Optional Topic)
(xi) Communicable disease

(9) Sudden Injury
(i) Wounds
(ii) Burns
(iii) Fractures and soft tissue injuries
(iv) Swollen, Painful or deformed limb

(10) Womb to Tomb;
(i) Emergency Child Birth
(ii) Managing Presumed Death on Board

(11) Practical Skills:
(i) Single Rescuer Adult CPR + AED
(ii) Primary and Secondary Assessment
(iii) Epipen Administration
(iv) Control of Severe Bleeding

(12) Other Medical emergencies such as:
(i) Stress reactions and allergic reactions;
(ii) Epilepsy;
(iii) Diabetes;
(iv) Air sickness;
(v) Gastrointestinal disturbances; and

(13) Travel health and hygiene including:
(i) The risk of contact with infectious diseases especially when operating into tropical and subtropical areas. Reporting of infectious diseases protection from infection and avoidance of waterborne and foodborne illness .Training shall include the means to reduce such risks;
(ii) Hygiene on board;
(iii) Death on board;
(iv) Handling of clinical waste;
(v) Aircraft disinsection; and
(vi) Alertness management, physiological effects of fatigue, sleep physiology, circadian rhythm and time zone changes;
(vii) The use of appropriate aeroplane equipment including first aid kits, emergency medical kits, first aid oxygen and emergency medical equipment.

(b) Medical aspects and first aid training shall be delivered by an EMS assessment body accepted by the Authority. The following requirement shall be met:

(1) An Emergency Medical Services (EMS) assessment body shall be managed by a person who will be responsible for:

(i) ensuring that its affiliated Instructors adhere to the standards and guidelines contained in this CAR

(ii) Ensuring that all Faculty and Instructors affiliated with or teaching classes for the training center are properly qualified and approved /or authorized by the GCAA

(iii) Ensuring that appropriate equipment is available to Instructors for use during the courses in sufficient quantities to allow the student adequate hands-on practice of required psychomotor skills

(iv) Ensuring adequate classroom health and safety to prevent injury and minimize the risk of disease transmission

(v) Removing Faculty and Instructors from the Emergency Service assessment body involved in dishonest, unprofessional, unethical or illegal conduct, including but limited to, issuing unearned certificate or withholding properly earned certificate and notifying the GCAA of their removal.

(2) The Emergency Medical Service assessment body shall have policies, manual and procedures that address, at a minimum:

(i) The means to comply with the applicable regulation developed in accordance with Appendix 4 to Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015;

(ii) Certificate and final exam security

(iii) Classroom and Instructor quality assurance

(iv) Equipment maintenance and contamination

(v) Professional conduct

(3) The Emergency Medical Service assessment body shall have comprehensive and legally sound document retention practices to protect their employees and managers in case of litigation or investigation; all records pertaining to training centers, Faculty, Instructors, Courses and course evaluations for no less than five years.

(4) The course syllabus shall comply with the GCAA Aviation First Aid training manual and requirements and shall provide the following programs/or courses:

(i) Basic First Aid for adults/child/Infant in an aircraft setting

(ii) CPR and AED for adults/child/Infant in an aircraft environment

(iii) On Board Emergency Child birth)

(iv) Management of Death on Board

(5) All appropriate first aid and resuscitation training equipment shall be available clean, operable and ready for use in adequate quantities at each required course conducted. Equipment needed for the cabin crew training may include the following:

(i) Infant, child and Adult CPR manikins with protective and sanitizing accessories.

(ii) CPR Barrier Devices (face shields, masks) in adult, child and infant sizes

(iii) Automated external Defibrillator trainer

(iv) Supplemental oxygen delivery devices in adult, child and infant size.

(v) First Aid Kits and Supplies

Note: equipment needs may vary according to the airline protocol. The use of any equipment not listed above must be added to the organization/airline policy, and the Cabin crew must be trained to use them (e.g. Telemedicine, pulse oximeter, spacers).

(6) The Emergency Medical Service assessment body shall acquire:

(i) An authorized version of the -Aviation First Aid Provider Manual provided for each candidate prior to attending the course

(ii) An authorized version of the Aviation First Aid Instructor Manual, with PPP or DVD

(7) The Emergency Medical Service assessment body shall ensure that each Instructor has access to:

(i) The latest version of the organization Instructor Guide

(ii) A sufficient quantity of printed organization Quick Reference guide which comply with the following:

- Easy to use
- Sign, symptoms & treatment are easily identified
- Topic heading on outer margin for easy look up
- Just the right amount of information – not too much, not too little

(8) The Emergency Medical Service assessment body shall have adequate facilities for effective learning:with:

(i) appropriate space for optimal learning. In general, the following parameters shall be adhered to:

- Classroom size of no less than 400 square feet
- Chairs and tables to accommodate each participant and Instructor.
- For courses involving CPR, carpeting or mats on which students may kneel

(ii) Appropriate audio-visual equipment.

(iii) Appropriate lighting, heating cooling and ventilation

(9) The Emergency Medical Service assessment body shall protect the health and safety of the participants and Instructors and prevent the spread of infectious disease and injuries by ensuring instructors:

(i) follow all recommendation regarding decontamination and sanitary practice supplied by the manufacture of the manikins used during the training.

(ii) provide the participants with sanitary personal protective equipment, including but not limited to face shields or masks and gloves.

(iii) clean their hands often with soap and water and encourage their student to do the same.

(iv) warn students to avoid awkward or extreme postures of the body.

(v) warn students about inappropriate student-on- student practice. Certain psychomotor skills are not appropriate for student-on –student practice and must be performed on training manikins designed for that purpose. Examples of these skills include abdominal thrusts, rescue breathing, and chest compression.

(vi) ensure there are no obvious hazards in the classroom such as extension cords that present a tripping hazard, know and share:

- The location of nearest telephone.
- Location of fire/emergency exits, fire alarm pull stations, and best emergency evacuation route.
- The location of the first aid kit, AED and fire extinguisher.
- Verify that each AED Trainer is not a live AED and the device is incapable of delivering a shock

(vii) provide a step by step instructions on cleaning CPR manikins and equipmentas following:

- Manikin Cleaning between student use:
    - Clean the face, the inside of the mouth, and other parts used by previous student with a saturated, clean hypochlorite solution or 70% alcohol 2x2

or 4x4. The surfaces to remain wet for at least 30 seconds before they are wiped dry with a second piece of clean, absorbent material.

- If a protective face shield/plastic airway is used, it must be changed prior to the next student.

- Manikin cleaning after the class:
  - Disassemble manikin as directed by manufacturer.
  - Thoroughly wash all external and internal surfaces (also reusable face pieces) with warm soapy water and brushes.
  - Rinse all surfaces with fresh water.
  - Wet all surfaces for 10 minutes in a mixture of ¼ cup sodium hypochlorite solution to 4 liters of tap water. This solution must be made fresh for each class and discarded after each use.
  - Rinse with fresh water and dry all external and internal surfaces. Then rinse with alcohol.
  - Let air dry.
  - Keep CPR equipment clean by storing in a clean area.
  - Any other instructions in the BLS instructor manual for more information.

(10) The Emergency Medical Service assessment body shall have at least one instructor who has been found in compliance with the following requirements:

(i) He/she is employed by an Emergency Medical Service assessment body teach First Aid for Cabin Crew

(ii) He/she has attended an Aviation First Aid provider program and he/she is qualified on both practical and written exams

(iii) He/she has received a score of 80% or higher on the Core Instructor Training course (or attend the 1 day classroom course, whichever is preferable)

(iv) He/she has attended and he/she is qualified on all evaluations set in the GCAA Aviation First Aid Instructor Training course.

(v) He/she has receivde clearance in conducting the Aviation First Aid course by an Emergency Medical Service assessment body.

Note: Emergency Medical Service Training and assessment body may employ additional Instructor/s who are not affiliated with the training center but is approved by the GCAA to teach the programs offered.

(11) The Emergency Medical Service assessment body shall have at least one authorized, affiliated, Aviation First Aid Faculty Instructor for every **15** registered Aviation First Aid Instructor and shall have competence to teach, evaluate and certify instructors to act as Aviation First Aid Faculty Instructor after he/she has been found in compliance with the following requirements:

(i) He/she is employed by an Emergency Medical Service assessment body to teach First Aid for Cabin Crew

(ii) He/she can demonstrated a minimum of 2 years teaching experience

(iii) He/she has conducted a minimum of 4 Aviation First Aid course within last 2 years

(iv) He/she has been required by the registered Emergency Medical Service assessment body to be trained as Faculty

(v) He/she attends the Aviation First Aid Faculty training program and he/she has received a score of 80% or higher on the written evaluation.

(vi) He/she has received clearance in conducting an Aviation First Aid Instructors course from an Emergency Medical Service assessment body

(12) The Emergency Medical Service assessment body shall establish a quality-valued review of the capacity of a body to conduct Aviation First Aid courses according to GCAA regulation.

(13) The Emergency Medical Service assessment body shall pass an evaluation by the Authority to:

(i) assure the continued integrity, credibility, and quality of training course and materials and compliance with these rules.

(ii) Ensure fair and consistent quality assurance practices.

(iii) Provide recommendations to the training center to improve their services.

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AMC to Appendix 3 to CAR-OPS 1.1005/1.1010/1.1015 Medical Aspects and First Aid Training

Refer to GTF-FAT-001

---- END PROPOSAL 2 ----

PROPOSAL 2: Single pilot operations under IFR or at night

---- START PROPOSAL 2 ----

SUBPART H. PERFORMANCE CLASS B

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CAR–OPS 1.525 General

(a) ~~Except~~ Unless ~~where~~ approved by the Authority, an operator shall not operate a single-engine aeroplane:

(1) At night; or
(2) In Instrument Meteorological Conditions except under Special Visual Flight Rules.
~~(3) Shall ensure that the airworthiness certification of the aeroplane is appropriate and that the overall level of safety intended by the provisions of Annexes 6 and 8 is provided by:~~
~~(i). The reliability of the turbine engine;~~
~~(ii). The operator's maintenance procedures, operating practices, flight dispatch procedures and crew training programmes; and~~
~~(iii). Equipment and other requirements provided in accordance with Appendix 3 to Annex 6; and~~
~~(iv). Shall have an engine trend monitoring system: and~~
(v). ~~Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2005 shall have an automatic trend monitoring system~~.

Note: Limitations on the operation of single-engine aeroplanes are covered by CAR–OPS 1.240(a)(6).

(b) An operator shall treat two-engine aeroplanes which do not meet the climb requirements of Appendix 1 to CAR–OPS 1.525(b) as single-engine aeroplanes.

AMC to CAR-OPS 1.525

SINGLE-ENGINED TURBINE AEROPLANE OPERATIONS AT NIGHT OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (SET-IMC)

ANNUAL REPORT
After obtaining the initial approval, the operator should make available on an annual basis a report related to its SET-IMC operations containing at least the following information:
a) The number of flights operated;
b) The number of hours flown; and

c) The number of occurrences sorted by type.

TURBINE ENGINE RELIABILITY

a) The operator should obtain the power plant reliability data from the type certificate (TC) holder and/or supplemental type certificate (STC) holder.

b) The data for the engine-airframe combination should have demonstrated, or be likely to demonstrate, a power loss rate of less than 10 per million flight hours. Power loss in this context is defined as any loss of power, including in-flight shutdown, the cause of which may be traced to faulty engine or engine component design or installation, including design or installation of the fuel ancillary or engine control systems.

c) The in-service experience with the intended engine-airframe combination should be at least 100 000 h, demonstrating the required level of reliability. If this experience has not been accumulated, then, based on analysis or test, in-service experience with a similar or related type of airframe and turbine engine might be considered by the TC/STC holder to develop an equivalent safety argument in order to demonstrate that the reliability criteria are achievable.

MAINTENANCE PROGRAMME

The following maintenance aspects should be addressed by the operator:

a) Engine monitoring programme: The operator's maintenance programme should include an oil-consumption-monitoring programme that should be based on engine manufacturer's recommendations, if available, and track oil consumption trends. The monitoring should be continuous and take account of the oil added. An engine oil analysis programme may also be required if recommended by the engine manufacturer. The possibility to perform frequent (recorded) power checks on a calendar basis should be considered.

The engine monitoring programme should also provide for engine condition monitoring describing the parameters to be monitored, the method of data collection and a corrective action process, and should be based on the engine manufacturer's instructions. This monitoring will be used to detect propulsion system deterioration at an early stage allowing corrective action to be taken before safe operation is affected.

b) Propulsion and associated systems' reliability programme: A propulsion and associated systems' reliability programme should be established or the existing reliability programme supplemented for the particular engine-airframe combination. This programme should be designed to early identify and prevent problems, which otherwise would affect the ability of the aeroplane to safely perform its intended flight. Where the fleet of SET-IMC aeroplanes is part of a larger fleet of the same engine-airframe combination, data from the operator's total fleet should be acceptable.

For engines, the programme should incorporate reporting procedures for all significant events. This information should be readily available (with the supporting data) for use by the operator, type certificate (TC) holders, and the Authority to help establish that the reliability level set out as described in the paragraph above under the title Turbine Engine Reliability is achieved. Any adverse trend would require an immediate evaluation to be conducted by the operator in consultation with the Authority. The evaluation may result in taking corrective measures or imposing operational restrictions.

The engine reliability programme should include, as a minimum, the engine hours flown in the period, the power loss rate for all causes, and the engine removal rate, both rates on an annual basis, as well as reports with the operational context focusing on critical events. These reports should be communicated to the TC holder and the competent authority.

The actual period selected should reflect the global utilisation and the relevance of the experience included (e.g. early data may not be relevant due to subsequent mandatory modifications that affected the power loss rate).

After the introduction of a new engine variant and whilst global utilisation is relatively low, the total available experience may have to be used to try to achieve a statistically meaningful average.

TRAINING PROGRAMME

The operator's flight crew training and checking, established in accordance with SUB PART N (FLIGHT CREW), should incorporate the following elements:

a) Conversion training: Conversion training should be conducted in accordance with a syllabus devised for SET-IMC operations and include at least the following:

1) normal procedures:
   i) anti-icing and de-icing systems operation;
   ii) navigation system procedures;
   iii) radar positioning and vectoring, when available;
   iv) use of radio altimeter; and
   v) use of fuel control, displays interpretation;
2) abnormal procedures:
   i) anti-icing and de-icing systems failures;
   ii) navigation system failures;
   iii) pressurisation system failures;
   iv) electrical system failures; and
   v) engine-out descent in simulated IMC; and
3) emergency procedures:
   i) engine failure shortly after take-off;
   ii) fuel system failures (e.g. fuel starvation);
   iii) engine failure other than the above: recognition of failure, symptoms, type of failure, measures to be taken, and consequences;
   iv) depressurisation; and
   v) engine restart procedures:
      A) choice of an aerodrome or landing site; and
      B) use of an area navigation system;
   vi) air traffic controller (ATCO) communications;
   vii) use of radar positioning and vectoring (when available);
   viii) use of radio altimeter; and
   ix) practice of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power.

b) Conversion checking: The following items should be checked following completion of the SET-IMC operations conversion training as part of the operator's proficiency check (OPC):

1) conduct of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power;
2) engine restart procedures;
3) depressurisation following engine failure; and
4) engine-out descent in simulated IMC.

c) Use of simulator (conversion training and checking): Where a suitable full flight simulator (FFS) or a suitable flight simulation training device (FSTD) is available, it should be used to carry out training on the items under (a) and checking of the items under (b) above for SET-IMC operations conversion training and checking.

d) Recurrent training: Recurrent training for SET-IMC operations should be included in the recurrent training required by SUB PART N (FLIGHT CREW) for pilots carrying out SET-IMC operations. This training should include all items under (a) above.

e) Recurrent checking: The following items should be included into the list of required items to be checked following completion of SET-IMC operations recurrent training as part of the OPC:

1) conduct of the forced landing procedure until touchdown in simulated IMC, with zero thrust set, and operating with simulated emergency electrical power;
2) engine restart procedures;
3) depressurisation following engine failure; and
4) emergency descent in simulated IMC.

f) Use of simulator (recurrent training and checking): Following conversion training and checking, the next recurrent training session and the next OPCs including SET-IMC operations items should be conducted in a suitable FFS or FSTD, where available.

CREW COMPOSITION
Refer CAR OPS 1.940 (b) (1) (2

FLIGHT PLANNING
a) The operator should establish flight planning procedures to ensure that the routes and cruising altitudes are selected so as to have a landing site within gliding range.
b) Notwithstanding (a) above, whenever a landing site is not within gliding range, one or more risk periods may be used for the following operations:

1) over water;
2) over hostile environment; or
3) over congested areas.

Except for the take-off and landing phase, the operator should ensure that when a risk period is planned, there is a possibility to glide to a non-congested area.
The total duration of the risk period per flight should not exceed 15 min unless the operator has established, based on a risk assessment carried out for the route concerned, that the cumulative risk of fatal accident due to an engine failure for this flight remains at an acceptable level (see paragraph below under the title SAFETY RISK ASSESSMENT FOR A SPECIFIC ROUTE)
c) The operator should establish criteria for the assessment of each new route. These criteria should address the following:

1) the selection of aerodromes along the route;
2) the identification and assessment, at least on an annual basis, of the continued suitability of landing sites (obstacles, dimensions of the landing area, type of the surface, slope, etc.) along the route when no aerodrome is available; the assessment may be performed using publicly available information or by conducting on-site surveys;
3) assessment of en-route specific weather conditions that could affect the capability of the aeroplane to reach the selected forced landing area following loss of power (icing conditions including gliding descent through clouds in freezing conditions, headwinds, etc.);
4) consideration of landing sites' prevailing weather conditions to the extent that such information is available from local or other sources; expected weather conditions at landing sites for which no weather information is available should be assessed and evaluated taking into account a combination of the following information:
    i) local observations;
    ii) regional weather information (e.g. significant weather charts); and
    iii) terminal area forecast (TAF)/meteorological aerodrome report (METAR) of the nearest aerodromes; and
5) protection of the aeroplane occupants after landing in case of adverse weather.

d) At the flight planning phase, any selected landing site should have been assessed by the operator as acceptable for carrying out a safe forced landing with a reasonable expectation of no injuries to persons in the aeroplane or on the ground. All information reasonably practical to acquire should be used by the operator to establish the characteristics of landing sites.
e) Landing sites suitable for a diversion or forced landing should be programmed into the navigation system so that track and distance to the landing sites are immediately and continuously available. None of these preprogrammed positions should be altered in-flight.

ROUTE AND INSTRUMENT PROCEDURE SELECTION
The following should be considered by the operator, as appropriate, depending on the use of a risk period:
a) Departure
The operator should ensure, to the extent possible, that the instrument departure procedures to be followed are those guaranteeing that the flight path allows, in the event of power loss, the aeroplane to land on a landing site.
b) Arrival
The operator should ensure, to the extent possible, that the arrival procedures to be followed are those guaranteeing that the flight path allows, in the event of power loss, the aeroplane to land on a landing site.
c) En route
The operator should ensure that any planned or diversionary route should be selected and be flown at an altitude such that, in the event of power loss, the pilot is able to make a safe landing on a landing site.

LANDING SITE
A landing site is an aerodrome or an area where a safe forced landing can be performed by day or by night, taking into account the expected weather conditions at the time of the foreseen landing.
a) The landing site should allow the aeroplane to completely stop within the available area, taking into account the slope and the type of the surface.
b) The slope of the landing site should be assessed by the operator in order to determine its acceptability and possible landing directions.
c) Both ends of the landing area, or only the zone in front of the landing area for one-way landing areas, should be clear of any obstacle which may be a hazard during the landing phase.

LANDING SITE (Guidance Material)
a) When selecting landing sites along a route to be operated, it is recommended to prioritise the different types of landing sites as follows:
1) aerodromes with available runway lighting;
2) aerodromes without available runway lighting;
3) non-populated fields with short grass/vegetation or sandy areas.
b) When assessing the suitability of a landing site which is not an aerodrome, it is recommended to consider the following landing site criteria:
1) size and shape of the landing area:
i) landing sites with a circular shape providing multiple approach paths depending on the wind; and
ii) for other cases, landing sites with a minimum width of 45 m; and
2) type of surface: the surface of the landing area should allow a safe forced landing to be conducted.

SAFETY RISK ASSESSMENT FOR A SPECIFIC ROUTE (Guidance Material)
a) Introduction
The risk assessment methodology should aim at estimating for a specific route the likelihood of having fatalities due to emergency landing caused by engine failure. Based on the outcome of this risk assessment, the operator

may extend the duration of the risk period beyond the maximum allowed duration if no landing site is available within gliding range.

b) The safety target

The overall concept of SET-IMC operations is based on an engine reliability rate for all causes of 10 per million flight hours, which permits in compliance with SET-IMC requirements an overall fatal accident rate for all causes of 4 per million flight hours.

Based on accident databases, it is considered that the engine failure event does not contribute by more than 33 % to the overall fatal accident rate. Therefore, the purpose of the risk assessment is to ensure that the probability of a fatal accident for a specific flight following engine failure remains below the target fatal accident rate of 1.3×10^{-6}.

c) Methodology

The methodology aims at estimating the likelihood of failing to achieve a safe forced landing in case of engine failure, a safe forced landing being defined as a landing on an area for which it is reasonably expected that no serious injury or fatalities will occur due to the landing even though the aeroplane may suffer extensive damage.

This methodology consists of creating a risk profile for a specific route, including departure, en route and arrival airfield and runway, by splitting the proposed flight into appropriate segments (based on the flight phase or the landing site selected), and by estimating the risk for each segment should the engine fail in one of these segments. This risk profile is considered to be an estimation of the probability of an unsuccessful forced landing if the engine fails during one of the identified segments.

When assessing the risk for each segment, the height of the aeroplane at which the engine failure occurs, the position relative to the departure or destination airfield or to an emergency landing site en route, and the likely ambient conditions (ceiling, visibility, wind and light) should be taken into account, as well as the standard procedures of the operator (e.g. U-turn procedures after take-off, use of synthetic vision, descent path angle for standard descent from cruising altitude, etc.).

The duration of each segment determines the exposure time to the estimated risk. The risk is estimated based on the following calculation:

Segment risk factor = segment exposure time (in s)/3 600 × probability of unsuccessful forced landing in this segment x assumed engine failure rate per flight hour (FH).

By summing up the risks for all individual segments, the cumulative risk for the flight due to engine failure is calculated and converted to risk on a ‘per flight hour’ basis.

This total risk must remain below the target fatal accident rate of 1.3×10^{-6} as under (b) above.

d) Example of a risk assessment

An example of such a risk assessment is provided below. In any case, this risk assessment is an example designed for a specific flight with specific departure and arrival aerodrome characteristics. It is an example of how to implement this methodology, and all the estimated probabilities used in the table below may not directly apply to any other flight.

The meaning of the different parameters used is further detailed below:

AD/Other: ‘AD’ is ticked whenever only aerodromes are selected as landing sites in the segment concerned. ‘Other’ is ticked if the selected landing sites in the segment concerned are not aerodromes. When a risk period is used by the operator, none of the two boxes (neither ‘AD’ nor ‘Other’) are ticked.

Segment exposure time: this parameter represents the duration of each segment in seconds (s).

Estimated probability of an unsuccessful forced landing if engine fails in the segment: probability of performing in the segment a safe forced landing following engine power loss.

Segment risk factor: risk of an unsuccessful forced landing (because of power loss) per segment (see formula above).

		LANDING SITE				Assumed engine failure rate per FH			1,00x10-5
Segments of flight	Assumed height or height band above ground level (AGL) in ft	AD	Other	Segment exposure time (in s)	Cumulative flight time from start of take-off to end of segment (in s)	Estimated probability of unsuccessful forced landing if engine fails in this segment	Segment risk factor	Cumulative risk per flight	Comment on estimation of unsuccessful outcome
Take-off (T-O) ground roll	0 ft	X		20	20	0.01 %	5.56 x 10-12	5.56 x 10-12	T-O aborted before being airborne. Runway long enough to stop the aircraft.
Climb-out	0-50 ft	X		8	28	0.10 %	2.22 x 10-11	2.78 x 10-11	Aircraft aborts T-O and lands ahead within runway length available.
	50-200 ft	X		10	38	1.00 %	2.78 x 10-10	3.06 x 10-10	
	200-1 100 ft			36	74	100.00 %	1.00 x 10-7	1.00 x 10-7	Aircraft has to land ahead outside airfield with little height for manoeuvring
	1 100-2 000 ft	X		36	110	50.00 %	5.00 x 10-8	1.50 x 10-7	U-turn and landing at opposite q-code for magnetic heading of a runway (QFU) possible.
	2 000-4 000 ft	X		80	190	25.00 %	5.56 x 10-8	2.06 x 10-7	
Climbing to en route height	4 000-10 000ft	X	X	240	430	5.00 %	3.33 x 10-8	2.39 x 10-7	Aircraft able to operate a glide-in approach.
Cruising: emergency area available	≤ 10 000 ft	X		5 400	5 830	5.00 %	7.50 x 10-7	9.89 x 10-7	En route cruising time with available landing sites along the route within gliding range.
Cruising: emergency area NOT available	≤ 10 000 ft			300	6130	100.00 %	8.33 x 10-7	1.82 x 10-6	En route cruising time without available landing sites within gliding range.

Descent to initial approach fix for instrument flight rules (IFR) approach	10 000-4 000 ft on a 4° slope (1 200 ft/min)	X	300	6 430	5.00 %	4.17×10^{-8}	1.86×10^{-6}	Descent with available landing sites within gliding range, and destination not reachable.
Aircraft has to descend below the glide approach capability to set up for a normal powered landing from 1 000 ft on a 3° approach path	4 000-1 000 ft on the approach	X	150	6 580	50.00 %	2.08×10^{-7}	2.07×10^{-6}	Aircraft descends below the height needed to maintain a glide approach for reaching the airfield. Therefore, it may land short of airfield if engine fails.
Aircraft descends on a 3° approach path	1 000 -50 ft on approach at 120 kt (600 ft/min)		95	6 675	100.00 %	2.64×10^{-7}	2.34×10^{-6}	Aircraft assumes 3° glideslope, regained to ensure normal landing. Therefore, it may undershoot the landing field if engine fails at this late stage.
Landing	50 ft above threshold until touchdown	X	10	6 685	5.00 %	1.39×10^{-9}	2.34×10^{-6}	Aircraft over runway. Engine is to be idled anyway, but failure, while airborne, may surprise pilot and result in hard landing.
Landing ground run	Touchdown to stop	X	15	6 700	0.01 %	4.17×10^{-12}	2.34×10^{-6}	Aircraft on ground. Risk negligible, if engine stops on the example runway (very long) providing that all services are retained.
							1.26×10^{-6}	Risk per flight

Probability in %	Description
0	Impossible
0-1	Negligible likelihood / remote possibility
1-10	Possible but not likely
10-35	Moderate likely
35-65	Possible
65-90	Likely
90-99	Almost certain
99-100	certain

CONTINGENCY PROCEDURES

When a risk period is used during the take-off or landing phase, the contingency procedures should include appropriate information for the crew on the path to be followed after an engine failure in order to minimise to the greatest extent possible the risk to people on the ground.

INSTRUMENTS AND EQUIPMENT

To refer to CAR–OPS 1.652- requirements on Flight and navigational instruments and associated equipment when conducting night operations and IFR.

ATTITUDE INDICATORS

A backup or standby attitude indicator built in the glass cockpit installations is an acceptable means of compliance for the second attitude indicator.

AIRBORNE WEATHER-DETECTING EQUIPMENT

The airborne weather-detecting equipment should be an airborne weather radar, as defined in the applicable Certification Specification — European Technical Standard Order (CS-ETSO) issued by the EASA, or equivalent.

AREA NAVIGATION SYSTEM

The area navigation system should be based on a global navigation satellite system (GNSS) stand-alone receiver or multi-sensor system, including at least one GNSS sensor, to enable at least required navigation performance approach (RNP APCH) operations without vertical guidance.

AREA NAVIGATION SYSTEM (Guidance Material)

Acceptable standards for the area navigation system are ETSO-145/146c, ETSO-C129a, ETSO-C196a or ETSO-C115 issued by EASA or equivalent.

LANDING LIGHTS (Guidance Material)

In order to demonstrate the compliance of its aeroplane's landing lights with the 200-ft illumination capability requirement, and in the absence of relevant data available in the aircraft flight manual (AFM), the operator should liaise with the type certificate (TC) holder or supplemental type certificate (STC) holder, as applicable, to obtain a statement of compliance.

ELEMENTS AFFECTING PILOT'S VISION FOR LANDING (Guidance Material)

Examples of elements affecting pilot's vision for landing are rain, ice and window fogging.

EMERGENCY ENGINE POWER CONTROL DEVICE

The means that allows continuing operation of the engine within a sufficient power range for the flight to be safely completed in the event of any reasonably probable failure/malfunction of the fuel control unit should enable the fuel flow modulation

CAR-OPS 1.940 Composition of Flight Crew

(See Appendix 1 & 2 to CAR-OPS1.940)

(a) An operator shall ensure that:

(1) The composition of the flight crew and the number of flight crew members at designated crew stations are both in compliance with, and no less than the minimum specified in, the Aeroplane Flight Manual (AFM);
(2) The flight crew includes additional flight crew members when required by the type of operation, and is not reduced below the number specified in the Operations Manual;
(3) All flight crew members hold an applicable and valid licence acceptable to the Authority and are suitably qualified and competent to conduct the duties assigned to them;
(4) Procedures are established, acceptable to the Authority, to prevent the crewing together of inexperienced flight crew members (See AMC OPS 1.940(a)(4));
(5) One pilot amongst the flight crew, qualified as a pilot-in-command in accordance with the requirements governing Flight Crew Licences, is designated as the commander who may delegate the conduct of the flight to another suitably qualified pilot; and

(6) When a dedicated System Panel Operator is required by the AFM, the flight crew includes one crew member who holds a Flight Engineer's licence or is a suitably qualified flight crew member and acceptable to the Authority.
(7) When engaging the services of crew members from other organisation or other individuals, there shall be an agreement in place to ensure the legal aspects and the requirements of Subpart N are complied with. In this respect, particular attention must be paid to the total number of aircraft types or variants that a flight crew member may fly for the purposes of commercial air transportation, which must not exceed the requirements prescribed in CAR-OPS 1.980 and CAR-OPS 1.981, including when his services are engaged by another operator. For crew members serving the operator as a commander, initial operator's Crew Resource Management (CRM) training shall be completed before commencing unsupervised line flying. However, for crew members serving the operator as a commander, initial CRM training shall be completed before commencing unsupervised line flying unless the crew member has previously completed an initial operator's CRM course.
(8) The flight crew include at least one member who holds a flight navigator licence in all operations where, as determined by the Authority, navigation necessary for the safe conduct of the flight cannot be adequately accomplished by the pilots from the pilot station.
(9) Crew composition for VFR day flight may be performed by single Pilot.

(b) Minimum flight crew for operations under IFR or at night. For operations under IFR or at night, an operator shall ensure that:

(1) For all turbo-propeller aeroplanes with a maximum approved passenger seating configuration of more than 9 and for all turbojet aeroplanes, the minimum flight crew is 2 pilots; or

(2) Aeroplanes other than those covered by sub-paragraph (b)(1) above are operated by a single pilot provided that the requirements of Appendix 2 to CAR-OPS 1.940 are satisfied. If the requirements of Appendix 2 are not satisfied, the minimum flight crew is 2 pilots.

(c) Minimum flight crew for operations under VFR.

For VFR Operations single engine aeroplane with MAPSC of 9 seat or less or MTOM of 5700kg or below, single pilot commercial operations may be performed with minimum pilot as describes in AFM. This is applicable for A to A operations or A to B operations within UAE or within the region subject to acceptability by applicable states.

Appendix 2 to CAR-OPS 1.940 Single pilot operations under IFR or at night

(a) Aeroplanes referred to in CAR-OPS 1.940(b)(2) may be operated by a single pilot under IFR or at night when the following requirements are satisfied:

(1) The operator shall include in the Operations Manual a pilot's conversion and recurrent training programme which includes the additional requirements for a single pilot operation;

…

The pilot shall have a minimum of 100 ~~50~~ hours flight time on the specific type or class of aeroplane under IFR. A lesser number of flight hours under IFR may be accepted when the flight crew member has significant previous IFR experience ~~of which 10 hours is as commander~~; and

(5) The minimum required recent experience for a pilot engaged in a single-pilot operation under IFR or at night shall be 5 IFR flights, including 3 instrument approaches, carried out during the preceding 90 days on the type or class of aeroplane in the single-pilot role. This requirement may be replaced by an IFR instrument approach check on the type or class of aeroplane.

---- END PROPOSAL 2----

PROPOSAL 3: GNSS, Aircraft in distress, and Aircraft Global Tracking

---- START PROPOSAL 3----

SUBPART D – OPDERATIONAL PROCEDURES

…

CAR-OPS 1. 247 Aircraft Tracking System — Aeroplanes

The provisions describe herein are applicable only to commercial operators and not private operators or operators involved in commercial activities as defined by CAR-OPS 1.003 (c).

(a) By 1st March 2019 at the latest, the operator shall establish and maintain, as part of the system for exercising operational control over the flights, an aircraft tracking system, which includes the flights eligible to (b) when performed with the following aeroplanes:

(1) aeroplanes with an MCTOM of more than 27 000 kg, with an MOPSC of more than 19, and first issued with an individual CofA before 1st March 2019 , which are equipped with a capability to provide a position additional to the secondary surveillance radar transponder;

(2) all aeroplanes with an MCTOM of more than 27 000 kg, with an MOPSC of more than 19, and first issued with an individual CofA on or after 1st March 2019 ; and

(3) all aeroplanes with an MCTOM of more than 45 500 kg and first issued with an individual CofA on or after 1st March 2019 .

(b) Flights shall be tracked by the operator from take-off to landing, except when the planned route and the planned diversion routes are fully included in airspace blocks where:

(1) ATS surveillance service is normally provided which is supported by ATC surveillance systems locating the aircraft at time intervals with adequate duration; and

(2) the operator has provided to competent air navigation service providers necessary contact information.

AMC1 OPS 1.247 Aircraft tracking system — Aeroplanes

EQUIPMENT, PERFORMANCE AND PROCEDURES WHEN AIRCRAFT TRACKING IS REQUIRED

(a) Automatic tracking of aeroplane position

The aircraft tracking system should rely on equipment capable of automatically detecting and transmitting a position report to the aircraft operator, except if (d)(2) applies.

(b) Position reporting period

The tracking of an individual flight should provide a position report at time intervals which do not exceed 15 minutes.

(c) Content of position reports

Each position report should contain at least the latitude, the longitude and the time of position determination and whenever available, an indication of the aeroplane altitude, except that for each flight:

(1) One of the position reports may contain only time-stamped data indicating that the aeroplane has left the gate;

(2) One of the position reports may contain only time-stamped data indicating that the aeroplane has become airborne;

(3) One of the position reports may contain only time-stamped data indicating that the aeroplane has landed; and

(4) One of the position reports may contain only time-stamped data indicating that the aeroplane has reached the gate.

(d) Source of position data

The data contained in a position report may come from:

(1) ATC surveillance systems, if the ATC surveillance data source is capable of providing this data with a delay equal to or less than 10 minutes;

(2) the flight crew, if the planned flight duration is less than two position reporting periods;

(3) aeroplane systems. In that case:

(i) the source of time, latitude and longitude data should be the navigation system of the aeroplane or an approved GNSS receiver;

(ii) the source of altitude data should be:

(A) the same source as for time, latitude and longitude data, or

(B) an approved source of pressure altitude; and

(iii) the delivery time of position reports from the aeroplane to the operational control over the flight should, to the extent possible, not exceed 10 minutes; or

(4) any data source when the position report is of a type designated by (c)(1), (c)(2), (c)(3) or (c)(4). In that case, the delivery time of position reports from the data source to the operational control over the flight should, to the extent possible, not exceed 10 minutes.

(e) Temporary lack of aircraft tracking data

Aircraft tracking data may be incomplete due to a temporary or unexpected issue prior to or during the flight. However, the operator should:

(1) identify any loss of aircraft tracking data which is not due to a temporary issue, and

(2) address any systematic lack of aircraft tracking data affecting a given aeroplane or a given route in a timely manner.

(f) Operational control over the flights

When abnormal flight behaviour is suspected, this should be checked and acted upon without delay.

(g) Recording of aircraft tracking data during normal operation

When the tracking of a flight is required, all related aircraft tracking data should be recorded on the ground, including position data from ATC surveillance systems when they are used. The aircraft tracking data of a given flight should be retained until confirmation that the flight is completed and no accident or serious incident occurred.

(h) Preserving aircraft tracking data after an accident or a serious incident

Following an accident or a serious incident, the operator should retain the aircraft tracking data of the involved flight for at least 30 days. In addition, the operator should be capable of providing a copy of this data without delay and in an electronic format that is human-readable using a common text file editor.

(i) Procedures

The operator should establish procedures describing its aircraft tracking system, including the identification of abnormal flight behaviour and the notification of the competent ATS unit, when appropriate. These procedures should be integrated with the emergency response plan of the operator.

AMC2 OPS 1.247 Aircraft tracking system — Aeroplanes

ROUTES INCLUDED IN AIRSPACE COVERED BY ATS SURVEILLANCE

(a) Trajectory points located at a distance of less than 50 NM from the departure airfield and trajectory points located at a distance of less than 50 NM from the destination airfield may be considered as not part of the ‘planned route’.

(b) Trajectory points located at a distance of less than 50 NM from any diversion airfield may be considered as not part of the ‘planned diversion routes’.

(c) An ATS surveillance service may be considered ‘supported by ATC surveillance systems locating the aircraft at time intervals with adequate duration’ if those ATC surveillance systems are capable of locating aircraft at time intervals not exceeding 15 minutes when operated normally.

(d) When applicable, the operator should check that the conditions required for using the exception defined by CAR OPS 1.247 (b) are fulfilled before operating into new airspace blocks.

(e) When applicable, the operator should check at time intervals not exceeding 180 calendar days that the conditions required for using the exception defined by CAR OPS 1.247 (b) are maintained.

GM1 OPS 1.247 Aircraft tracking system — Aeroplanes

EXPLANATION OF TERMS

For the understanding of the terms used in CAR OPS 1.247:

(a) 'capability to provide a position additional to the secondary surveillance radar transponder' means airborne equipment other than the SSR transponder, which is operative and which can be used to automatically transmit time-stamped position data without change to the approved airborne systems; and

(b) 'abnormal flight behaviour' means, in the context of an aircraft flight tracking system, an event affecting a flight:

(1) Which is outside of the parameters defined by the operator for normal operations or which indicates an obvious deviation from normal operation; and

(2) For which the operator has determined that it poses a risk for the safe continuation of the flight or for third parties.

GM2 OPS 1.247 Aircraft tracking system — Aeroplanes

DETERMINING WHETHER A FLIGHT NEEDS TO BE TRACKED

Table 1 provides a summary of the cases applicable to an aeroplane which is within the scope of CAR OPS 1.247 (a).

Table 1: Cases applicable to the flight of an aeroplane subject to the aircraft tracking requirement

Condition 1: The planned route and the planned diversion routes are included in airspace blocks where ATS surveillance service is normally provided.	Condition 2: The ATS surveillance service provided in all airspace blocks determined by Condition 1 is supported by ATC surveillance systems locating the aircraft at time intervals with adequate duration.	Condition 3: The operator has provided all air navigation service providers competent for the airspace blocks determined by Condition 1 with the necessary contact information.	Case considered: Aeroplane that is within the scope of CAR OPS 1.247 (a).
Conditions 1, 2 and 3 are met altogether.			The flight does not need to be tracked (refer to CAR OPS 1.247 (b)). Note: The operator should check at regular time intervals that Conditions 1, 2 and 3 are still met (refer to AMC2 CAR OPS 1.247).
Either Condition 1, Condition 2 or Condition 3 is not met.			The flight shall be tracked (refer to CAR OPS 1.247(b)). Note: Lack of aircraft tracking data due to a temporary or unexpected issue may be acceptable (refer to AMC1 CAR OPS 1.247). Examples of issues (list is indicative and not exhaustive): airborne equipment found inoperative, transmission link disturbed by environmental factors; issue with the ground-

	based infrastructure or the space-based infrastructure.

GM3 OPS 1.247 Aircraft tracking system — Aeroplanes

METHOD FOR ASSESSING WHETHER A FLIGHT NEEDS TO BE TRACKED

The following gives an example of a method to assess whether flights performed along a given route need to be tracked.

(a) Determine the planned route and the planned diversion routes and consider only points of these routes located at a distance of greater than or equal to 50 NM from the departure airfield, the destination airfield and the diversion airfields. If there is no such point, then the flight does not need to be tracked, otherwise go to (b).

(b) Identify all airspace blocks crossed by the result of (a) and go to (c).

(c) If every airspace block meets all of the following conditions, then the flight does not need to be tracked:

(1) ATS surveillance service is provided in the airspace block;

(2) This ATS surveillance service relies on ATC surveillance systems which are normally capable of detecting aircraft in the airspace block at time intervals not exceeding 15 minutes; and

(3) The air navigation service provider competent for the airspace block has information sufficient to contact the on-duty staff at the operator.

GM4 OPS 1.247 Aircraft tracking system — Aeroplanes

POSSIBLE SOURCES AND MINIMUM CONTENT OF A POSITION REPORT

Table 1 presents a summary of the possible sources and the minimum content of a position report according to AMC1 CAR OPS 1.247.

Table 1: Possible sources and minimum content of a position report

Planned flight duration	Possible sources of a position report	Minimum content of a position report
Flight duration < 2×reporting period	• Airborne equipment (automatic transmission); • Flight crew; or • ATC surveillance systems.	Latitude, longitude and time (and whenever available altitude), except for the position reports designated by point (c)(1), (c)(2), (c)(3) and

		(c)(4) of AMC1 CAR OPS 1.247.
Flight duration ≥ 2×reporting period	• Airborne equipment (automatic transmission); • ATC surveillance systems; • Flight crew if the flight is not required to be tracked; or • Any source for position reports designated by point (c)(1), (c)(2), (c)(3) and (c)(4) of AMC1 CAR OPS 1.247.	

GM5 OPS 1.247 Aircraft tracking system — Aeroplanes

AIRCRAFT TRACKING — CHOICE OF THE POSITION REPORTING PERIOD

(a) Unless the aircraft tracking system includes functionalities enhancing the detection of deviations from normal operation (e.g. airborne systems capable of automatically transmitting more information under some conditions, possibility for the operational control to adjust the position reporting period of an ongoing flight, etc.), the choice of the position reporting period has a significant influence on the effectiveness of the aircraft tracking system.

(1) Indeed, assuming that an operator has set itself the objective of detecting, within a given time T, deviations from normal operation, and that the operator relies for this purpose only on position reports, then the position reporting period needs to be less than T.

(2) Furthermore, when no other information than position reports is available to locate a missing aircraft, then the search zone is a circle with a radius corresponding to the distance likely to have been covered since the last detection. The corresponding search area grows as the square of the time, until the position of the aircraft is detected again or the fuel on board is exhausted. Taking the example of an aeroplane cruising at Mach 0.8 (i.e. covering a distance of about 8 NM per minute), after 15 minutes the search area is 155 000 square kilometres.

(3) In the publication of the Australian Transportation Safety Bureau titled 'The Operational Search for MH370' (dated October 2017), it is recommended that 'Aircraft operators, aircraft manufacturers, and aircraft equipment manufacturers investigate ways to provide high-rate and/or automatically triggered global position tracking in existing and future fleets'.

(b) It is advised to take the above into account when setting up the aircraft tracking system

GM6 OPS 1.247 Aircraft tracking system — Aeroplanes

PROVIDING CONTACT INFORMATION TO COMPETENT AIR NAVIGATION SERVICE PROVIDERS

One possible way of ensuring that contact information has been made available to all the competent air navigation service providers is to provide in the ATS flight plan (item 18 'Other information') information sufficient to contact the on-duty staff of the aircraft operator.

GM7 OPS 1.247 Aircraft tracking system — Aeroplanes

GUIDANCE

Additional guidance for the establishment of an aircraft tracking system is found in ICAO Circular 347 – Aircraft Tracking Implementation Guidelines, dated 2017.

SUBPART K – INSTRUMENT AND EQUIPMENT

…

CAR-OPS 1.728 Additional Equipment for location of Aircraft in distress

The following aeroplanes shall be equipped with robust and automatic means to accurately determine, following an accident where the aeroplane is severely damaged, the location of the point of end of flight:

(1) all aeroplanes with an MCTOM of more than 27 000 kg, with an MOPSC of more than 19 and first issued with an individual CofA on or after 1 January 2021; and
(2) all aeroplanes with an MCTOM of more than 45 500 kg and first issued with an individual CofA on or after 1 January 2021.

…

CAR-OPS 1.830 Extended overwater flights

(a) On overwater flights, an operator shall not operate an aeroplane at a distance away from land, which is suitable for making an emergency landing, greater than that corresponding to:

(1) 120 minutes at cruising speed or 400 nautical miles, whichever is the lesser, for aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or

(2) 30 minutes at cruising speed or 100 nautical miles, whichever is the lesser, for all other aeroplanes, unless the equipment specified in sub-paragraphs (b) and (c) below is carried.

…

(d) At the earliest practicable date, but not later than 1st March 2019, on all aeroplanes of a maximum certificated take-off mass of over 27 000 kg and with an MOPSC of more than 19 and all aeroplanes with an MCTOM of more than 45,500 kg involved in commercial operations shall be equipped with a securely attached underwater locating device operating at a frequency of 8.8 kHz ± 1 kHz, unless:

(1) The aeroplane is operated over routes on which it is not at a distance of more than 180 NM from the shore or

(2) The aeroplane is equipped with an automatic mean to determine the location of the point of end of flight within 6 NM accuracy (following an accident where the aeroplane is severely damaged).

…

SUBPART L - COMMUNICATION AND NAVIGATION EQUIPMENT

…

CAR-OPS 1.866 Transponder equipment

(See AMC OPS 1.866 Transponder Equipment)

(a) An operator shall not operate an aeroplane unless it is equipped with;
  (1) A pressure altitude reporting SSR (secondary surveillance radar) transponder; and
  (2) any other SSR transponder capability required for the route being flown.

b) An operator shall ensure that by 7 December 2017, that aeroplane:
  (1) operating under IFR, are equipped with SSR transponders having the capabilities set out in AMC OPS 1.866 Part 1;
  (2) with a maximum certified take-off mass exceeding 5700 kg or having a maximum cruising true airspeed capability greater than 250 knots, operating flights under IFR or within controlled airspace are equipped with SSR transponders having, in addition to the capabilities set out in AMC OPS 1.866 Part 1, 2 and 3. The ADS-B functionality shall be installed no later than the date mandating ADS-B (See CAR-OPS 1.867);
  (3) with a maximum certified take-off mass exceeding 5700 kg or having a maximum cruising true airspeed capability greater than 250 knots, operating flights under IFR or within controlled airspace, are equipped with SSR transponders having, in addition to the capabilities set out in AMC OPS 1.866 Part 1, 2 and 3. The ADS-B functionality shall be installed no later than the date mandating ADS-B (See CAR-OPS 1.867).

c) An operator shall ensure that aircraft equipped in accordance with paragraph b) and having a maximum certified take-off mass exceeding 5700 kg or having a maximum cruising true airspeed capability greater than 250 knots operate with antenna diversity as prescribed in paragraph 3.1.2.10.4 of Annex 10 to the Chicago Convention, Volume IV, Fourth Edition including all amendments up to No 85.

AMC OPS 1.866 Transponder Equipment

(See CAR-OPS 1.866)

a. Part 1: SSR transponder capabilities

1. The minimum capability for the secondary surveillance transponder should be Mode S Level 2 certified in accordance with paragraphs 2.1.5.1.2, 2.1.5.1.7 and 3.1.2.10 of Annex 10 to the Chicago Convention, Volume IV, Fourth Edition including all amendments up to No 85.

---- END PROPOSAL 3----