



สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

THAILAND CIVIL AVIATION REGULATION

TCAR OPS – Part NCO

Non-Commercial Air Operations with
Other-Than Complex Motor-Powered Aircraft

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RECORD OF REVISIONS

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INTRODUCTION AND APPLICABILITY

In this publication the word ‘must’ or ‘shall’ is used to indicate where the Director General requires the Organisation, owner or operator to respond to and comply with, or adhere closely to, the defined requirement

If the Organisation’s/owner’s/operator’s response is deemed to be inadequate by the Director General, a specific requirement or restriction may be applied as a condition of the appropriate instrument to be issued under Thailand Civil Aviation Regulations.

TCAR OPS is based on the latest consolidated version of Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations, as amended by Regulations up to (EU) No 2023/217. Notably, (EU) 2023/203 was not included as part of the initial issue.

TCAR OPS Part NCO is a part of the overall TCAR OPS Regulation set.

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TABLE OF CONTENTS

RECORD OF REVISIONS..... 3

LIST OF EFFECTIVE PAGES 5

INTRODUCTION AND APPLICABILITY 7

TABLE OF CONTENTS 9

SUBPART A: GENERAL REQUIREMENTS 14

 NCO.GEN.100 The competent authority 14

 NCO.GEN.101 Means of compliance 14

 NCO.GEN.103 Introductory flights 14

 NCO.GEN.104 Use of aircraft included in an AOC by an NCO operator 14

 NCO.GEN.105 Pilot-in-command responsibilities and authority..... 15

 NCO.GEN.110 Compliance with laws, regulations and procedure 16

 NCO.GEN.115 Taxiing of aeroplanes 16

 NCO.GEN.120 Rotor engagement — helicopters 16

 NCO.GEN.125 Portable electronic devices 17

 NCO.GEN.130 Information on emergency and survival equipment carried..... 17

 NCO.GEN.135 Documents, manuals and information to be carried 17

 NCO.GEN.140 Transport of dangerous goods 18

 NCO.GEN.145 Immediate reaction to a safety problem..... 18

 NCO.GEN.150 Journey log 18

 NCO.GEN.155 Minimum equipment list..... 19

SUBPART B: OPERATIONAL PROCEDURES 20

 NCO.OP.100 Use of aerodromes and operating sites 20

 NCO.OP.101 Altimeter check and settings 20

 NCC.OP.105 20

 NCO.OP.110 Aerodrome operating minima — aeroplanes and helicopters..... 20

 NCO.OP.111 Aerodrome operating minima — 2D and 3D approach operations..... 20

 NCO.OP.112 Aerodrome operating minima — circling operations with aeroplanes..... 22

 NCO.OP.113 Aerodrome operating minima — onshore circling operations with helicopters
 22

 NCO.OP.115 Departure and approach procedures — aeroplanes and helicopters..... 22

 NCO.OP.116 Performance-based navigation — aeroplanes and helicopters 23

 NCO.OP.120 Noise abatement procedures — aeroplanes and helicopters..... 23

 NCO.OP.125 Fuel/energy and oil supply — aeroplanes and helicopters..... 23

 NCO.OP.130 Passenger briefing 23

 NCO.OP.135 Flight preparation 23

 NCO.OP.140 Destination alternate aerodromes — aeroplanes..... 24

 NCO.OP.141 Destination alternate aerodromes — helicopters..... 24

 NCO.OP.142 Destination aerodromes — instrument approach operations 24

 NCO.OP.143 Destination alternate aerodromes planning minima — aeroplanes..... 24

 NCO.OP.144 Destination alternate aerodromes planning minima — helicopters..... 25

NCO.OP.145	Refuelling with passengers embarking, on board or disembarking	25
NCO.OP.147	Refuelling with engine(s)and/or rotors turning – helicopters	25
NCO.OP.150	Carriage of passengers	26
NCO.OP.155	Smoking on board — aeroplanes and helicopters	26
NCO.OP.160	Meteorological conditions.....	26
NCO.OP.165	Ice and other contaminants — ground procedures	26
NCO.OP.170	Ice and other contaminants — flight procedures	26
NCO.OP.175	Take-off conditions — aeroplanes and helicopters.....	27
NCO.OP.180	Simulated situations in flight.....	27
NCO.OP.185	NCO.OP.185 In-flight fuel/energy management	27
NCO.OP.190	Use of supplemental oxygen	28
NCO.OP.195	Ground proximity detection.....	28
NCO.OP.200	Airborne collision avoidance system (ACAS II)	28
NCO.OP.205	Approach and landing conditions — aeroplanes and helicopters.....	28
NCO.OP.206	Approach and landing conditions — helicopters	28
NCO.OP.210	Commencement and continuation of approach — aeroplanes and helicopters	29
NCO.OP.220	Airborne collision avoidance system (ACAS II)	29
SUBPART C: AIRCRAFT PERFORMANCE AND OPERATING LIMITATIONS.....		30
NCO.POL.100	Operating limitations — all aircraft.....	30
NCO.POL.105	Weighing	30
NCO.POL.110	Performance — general.....	30
SUBPART D: INSTRUMENTS, DATA AND EQUIPMENT.....		31
SECTION 1 Aeroplanes.....		31
NCO.IDE.A.100	Instruments and equipment — general	31
NCO.IDE.A.105	Minimum equipment for flight.....	31
NCO.IDE.A.110	Spare electrical fuses.....	32
NCO.IDE.A.115	Operating lights	32
NCO.IDE.A.120	Operations under VFR — flight and navigational instruments and associated equipment	32
NCO.IDE.A.125	Operations under IFR — flight and navigational instruments and associated equipment	33
NCO.IDE.A.130	Terrain awareness warning system (TAWS)	33
NCO.IDE.A.135	Flight crew interphone system.....	33
NCO.IDE.A.140	Seats, seat safety belts, restraint systems and child restraint devices	33
NCO.IDE.A.145	First-aid kit.....	34
NCO.IDE.A.150	Supplemental oxygen — pressurised aeroplanes.....	34
NCO.IDE.A.155	Supplemental oxygen — non-pressurised aeroplanes.....	34
NCO.IDE.A.160	Hand fire extinguishers.....	35
NCO.IDE.A.165	Marking of break-in points	35
NCO.IDE.A.170	Emergency locator transmitter (ELT).....	36
NCO.IDE.A.175	Flight over water.....	36

NCO.IDE.A.180	Survival equipment.....	37
NCO.IDE.A.190	Radio communication equipment.....	37
NCO.IDE.A.195	Navigation equipment	37
NCO.IDE.A.200	Transponder	37
NCO.IDE.A.205	Management of aeronautical databases.....	38
NCO.IDE.A.210	Surveillance Equipment.....	38
SECTION 2 Helicopters.....		39
NCO.IDE.H.100	Instruments and equipment — general.....	39
NCO.IDE.H.105	Minimum equipment for flight.....	39
NCO.IDE.H.115	Operating lights	40
NCO.IDE.H.120	Operations under VFR — flight and navigational instruments and associated equipment.....	40
NCO.IDE.H.125	Operations under IFR — flight and navigational instruments and associated equipment.....	41
NCO.IDE.H.126	Additional equipment for single pilot operations under IFR.....	41
NCO.IDE.H.135	Flight crew interphone system.....	41
NCO.IDE.H.140	Seats, seat safety belts, restraint systems and child restraint devices	41
NCO.IDE.H.145	First-aid kit.....	42
NCO.IDE.H.155	Supplemental oxygen — non-pressurised helicopters	42
NCO.IDE.H.160	Hand fire extinguishers	42
NCO.IDE.H.165	Marking of break-in points.....	42
NCO.IDE.H.170	Emergency locator transmitter (ELT).....	43
NCO.IDE.H.175	Flight over water	43
NCO.IDE.H.180	Survival equipment.....	43
NCO.IDE.H.185	All helicopters on flights over water — ditching	44
NCO.IDE.H.190	Radio communication equipment.....	44
NCO.IDE.H.195	Navigation equipment.....	44
NCO.IDE.H.200	Transponder	44
NCO.IDE.H.205	Management of aeronautical databases.....	45
NCO.IDE.H.210	Surveillance Equipment.....	45
SUBPART E: SPECIFIC REQUIREMENTS		46
SECTION 1 General		46
NCO.SPEC.100	Scope.....	46
NCO.SPEC.105	Checklist	46
NCO.SPEC.110	Pilot-in-command responsibilities and authority.....	46
NCO.SPEC.115	Crew responsibilities	47
NCO.SPEC.120	Task specialists responsibilities.....	47
NCO.SPEC.125	Safety briefing	48
NCO.SPEC.130	Minimum obstacle clearance altitudes — IFR flights	48
NCO.SPEC.145	Simulated situations in flight.....	48
NCO.SPEC.150	Ground proximity detection.....	48

NCO.SPEC.155	Airborne collision avoidance system (ACAS II)	48
NCO.SPEC.160	Release of dangerous goods	48
NCO.SPEC.165	Carriage and use of weapons	48
NCO.SPEC.170	Performance and operating criteria — aeroplanes	48
NCO.SPEC.175	Performance and operating criteria — helicopters	49
SECTION 2	Helicopter external sling load operations (HESLO)	50
NCO.SPEC.HESLO.100	Checklist	50
NCO.SPEC.HESLO.105	Specific HESLO equipment	50
NCO.SPEC.HESLO.110	Transportation of dangerous goods	50
SECTION 3	Human external cargo operations (HEC)	51
NCO.SPEC.HEC.100	Checklist	51
NCO.SPEC.HEC.105	Specific HEC equipment	51
SECTION 4	Parachute operations (PAR)	52
NCO.SPEC.PAR.100	Checklist	52
NCO.SPEC.PAR.105	Carriage of crew members and task specialists	52
NCO.SPEC.PAR.110	Seats	52
NCO.SPEC.PAR.115	Supplemental oxygen	52
NCO.SPEC.PAR.120	Release of dangerous goods	52
SECTION 5	Aerobatic flights (ABF)	53
NCO.SPEC.ABF.100	Checklist	53
NCO.SPEC.ABF.105	Documents and information	53
NCO.SPEC.ABF.110	Equipment	53
SECTION 6	Maintenance check flights (MCFs)	54
NCO.SPEC.MCF.100	Levels of maintenance check flights	54
NCO.SPEC.MCF.105	Operational limitations	54
NCO.SPEC.MCF.110	Checklist and safety briefing	54
NCO.SPEC.MCF.120	Flight crew requirements	54
NCO.SPEC.MCF.125	Crew composition and persons on board	54
NCO.SPEC.MCF.130	Simulated abnormal or emergency procedures in flight	54
NCO.SPEC.MCF.140	Systems and equipment	55

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SUBPART A: GENERAL REQUIREMENTS

NCO.GEN.100 The competent authority

The CAAT is the competent authority designated by the Kingdom of Thailand, where the aircraft is registered. For the purpose of TCAR OPS Part NCO, the CAAT is the competent authority exercising oversight, over operators operating aircrafts registered within the Kingdom of Thailand.

NCO.GEN.101 Means of compliance

Exceptionally, and only when so authorised by the CAAT, alternative means of compliance to those adopted by the CAAT may be used by an operator to establish compliance with the Air Navigation Act B.E 2497 and Kingdom of Thailand Civil Aviation Regulations.

NCO.GEN.103 Introductory flights

Introductory flights referred to in this TCAR OPS when conducted in accordance with this Part NCO, shall:

- (a) start and end at the same aerodrome or operating site,
- (b) be operated under VFR by day;
- (c) be overseen by a nominated person responsible for their safety; and
- (d) comply with any other conditions stipulated by the CAAT.

NCO.GEN.104 Use of aircraft included in an AOC by an NCO operator

- (a) An NCO operator may use other than complex motor-powered aircraft listed on an operator's AOC to conduct non-commercial operations in accordance with this part NCO.
- (b) The NCO operator using the aircraft in accordance with point (a) shall establish a procedure:
 - (1) clearly describing how operational control of the aircraft is transferred between the AOC holder and the NCO operator, as referred to in point ORO.GEN.310 of TCAR OPS Part ORO;
 - (2) describing the handover procedure of the aircraft upon its return to the AOC holder. That procedure shall be included in a contract between the AOC holder and the NCO operator. The NCO operator shall ensure that the procedure is communicated to the relevant personnel.
- (c) The continuing airworthiness of the aircraft used pursuant to point (a) shall be managed by organisation responsible for the continuing airworthiness for the aircraft included in the AOC, in accordance with the applicable requirement for continuing airworthiness.
- (d) The NCO operator using the aircraft in accordance with point (a) shall ensure the following:
 - (1) that every flight conducted under its operational control is recorded in the aircraft technical log system;
 - (2) that no changes to the aircraft systems or configuration are made;
 - (3) that any defect or technical malfunction occurring while the aircraft is under its operational control is reported to the organisation referred to in point (c) immediately after the flight;
 - (4) that the AOC holder receives a copy of any occurrence report related to the flights performed with the aircraft, completed in accordance with the applicable regulation on occurrence reporting the CAAT requirement no. 22.

NCO.GEN.105 Pilot-in-command responsibilities and authority

- (a) The pilot-in-command shall be responsible for:
- (1) the safety of the aircraft and of all crew members, passengers and cargo on board during aircraft operations as referred to in the air operations requirements of the Air Navigation Act B.E 2497, TCAR OPS and other Kingdom of Thailand Civil Aviation Regulations as they may be applicable;
 - (2) the initiation, continuation, termination or diversion of a flight in the interest of safety;
 - (3) ensuring that all operational procedures and checklists are complied with as referred to in TCAR OPS and other Kingdom of Thailand Civil Aviation Regulations as they may be applicable;
 - (4) only commencing a flight if he/she is satisfied that all operational limitations referred to in the in the Air Navigation Act B.E.2497, TCAR OPS and other other Kingdom of Thailand Civil Aviation Regulations as they may be applicable are complied with, as follows:
 - (i) the aircraft is airworthy;
 - (ii) the aircraft is duly registered;
 - (iii) instruments and equipment required for the execution of that flight are installed in the aircraft and are operative, unless operation with inoperative equipment is permitted by the minimum equipment list (MEL) or equivalent document, if applicable, as provided for in points NCO.IDE.A.105, NCO.IDE.H.105 or;
 - (iv) the mass of the aircraft and, the centre of gravity location are such that the flight can be conducted within limits prescribed in the airworthiness documentation;
 - (v) all equipment, baggage and cargo are properly loaded and secured and an emergency evacuation remains possible;
 - (vi) the aircraft operating limitations as specified in the aircraft flight manual (AFM) will not be exceeded at any time during the flight; and
 - (vii) any navigational database required for PBN is suitable and current;
 - (5) not commencing a flight if he/she is incapacitated from performing duties by any cause such as injury, sickness, fatigue or the effects of any psychoactive substance;
 - (6) not continuing a flight beyond the nearest weather-permissible aerodrome or operating site when his/her capacity to perform duties is significantly reduced from causes such as fatigue, sickness or lack of oxygen;
 - (7) deciding on acceptance of the aircraft with unserviceabilities in accordance with the configuration deviation list (CDL) or minimum equipment list (MEL), as applicable; and
 - (8) recording utilisation data and all known or suspected defects in the aircraft at the termination of the flight, or series of flights, in the aircraft technical log or journey log for the aircraft.
- (b) The pilot-in-command shall ensure that during critical phases of flight or whenever deemed necessary in the interest of safety, all crew members are seated at their assigned stations and do not perform any activities other than those required for the safe operation of the aircraft.
- (c) The pilot-in-command shall have the authority to refuse carriage of or disembark any person, baggage or cargo that may represent a potential hazard to the safety of the aircraft or its occupants.

- (d) The pilot-in-command shall, as soon as possible, report to the appropriate air traffic services (ATS) unit any hazardous weather or flight conditions encountered that are likely to affect the safety of other aircraft.
- (e) The pilot-in-command shall, in an emergency situation that requires immediate decision and action, take any action he/she considers necessary under the circumstances in accordance with the air operations requirements of the Air Navigation Act B.E 2497 and TCAR OPS. In such cases he/she may deviate from rules, operational procedures and methods in the interest of safety.
- (f) During flight, the pilot-in-command shall:
 - (1) keep his/her safety belt fastened while at his/her station; and
 - (2) remain at the controls of the aircraft at all times except if another pilot is taking the controls.
- (g) The pilot-in-command shall submit a report of an act of unlawful interference without delay to the CAAT and shall inform the designated local authority.
- (h) The pilot-in-command shall notify the nearest appropriate authority by the quickest available means of any accident involving the aircraft that results in serious injury or death of any person or substantial damage to the aircraft or property.

NCO.GEN.110 Compliance with laws, regulations and procedure

- (a) The pilot-in-command shall comply with the laws, regulations and procedures of those States where operations are conducted.
- (b) The pilot-in-command shall be familiar with the laws, regulations and procedures, pertinent to the performance of his/her duties, prescribed for the areas to be traversed, the aerodromes or operating sites to be used and the related air navigation facilities as referred to in Sections 17, 18, 18/2, 19, 21, 22, 27 of the Air Navigation Act B.E. 2497 and Kingdom of Thailand Civil Aviation Regulation and other national provision as they may be applicable

NCO.GEN.115 Taxiing of aeroplanes

An aeroplane shall only be taxied on the movement area of an aerodrome if the person at the controls:

- (a) is an appropriately qualified pilot; or
- (b) has been designated by the operator and:
 - (1) is trained to taxi the aeroplane;
 - (2) is trained to use the radio telephone, if radio communications are required;
 - (3) has received instruction in respect of aerodrome layout, routes, signs, marking, lights, air traffic control (ATC) signals and instructions, phraseology and procedures; and
 - (4) is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

NCO.GEN.120 Rotor engagement — helicopters

A helicopter rotor shall only be turned under power for the purpose of flight with a qualified pilot at the controls.

NCO.GEN.125 Portable electronic devices

The pilot-in-command shall not permit any person to use a portable electronic device (PED) on board an aircraft, including an electronic flight bag (EFB), that could adversely affect the performance of the aircraft systems and equipment or the ability of the flight crew member to operate the aircraft.

NCO.GEN.130 Information on emergency and survival equipment carried

Except for aircraft taking-off and landing at the same aerodrome/operating site, the operator shall, at all times, have available for immediate communication to rescue coordination centres (RCCs) lists containing information on the emergency and survival equipment carried on board.

NCO.GEN.135 Documents, manuals and information to be carried

- (a) The following documents, manuals and information shall be carried on each flight as originals or copies unless otherwise specified:
- (1) the AFM, or equivalent document(s);
 - (2) the original certificate of registration;
 - (3) the original certificate of airworthiness (CofA);
 - (4) the noise certificate, if applicable;
 - (5) the list of specific approvals, if applicable;
 - (6) the aircraft radio licence, if applicable;
 - (7) the third party liability insurance certificate(s);
 - (8) the journey log, or equivalent, for the aircraft;
 - (9) details of the filed ATS flight plan, if applicable;
 - (10) current and suitable aeronautical charts for the route area of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;
 - (11) procedures and visual signals information for use by intercepting and intercepted aircraft;
 - (12) the MEL or CDL, if applicable; and
 - (13) a passenger manifest, in the case of an international passenger flight;
 - (14) a cargo manifest, in the case of an international cargo flight; and
 - (15) any other documentation that may be pertinent to the flight or is required by the States concerned with the flight.
- (b) Notwithstanding (a), on flights:
- (1) intending to take off and land at the same aerodrome/operating site; or
 - (2) remaining within a distance or area determined by the CAAT,
 - (3) the documents and information in (a)(2) to (a)(8) may be retained at the aerodrome or operating site.
- (c) The pilot-in-command shall make available within a reasonable time of being requested to do so by the CAAT, the documentation required to be carried on board.

NCO.GEN.140 Transport of dangerous goods

- (a) The transport of dangerous goods by air shall be conducted in accordance with Annex 18 to the Chicago Convention as last amended and amplified by the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905), including its supplements and any other addenda or corrigenda.
- (b) Dangerous goods shall only be transported by the operator approved in accordance with TCAR OPS Part SPA, Subpart G except when:
 - (1) they are not subject to the Technical Instructions in accordance with Part 1 of those Instructions; or
 - (2) they are carried by passengers or the pilot-in-command, or are in baggage, in accordance with Part 8 of the Technical Instructions;
- (c) The pilot-in-command shall take all reasonable measures to prevent dangerous goods from being carried on board inadvertently.
- (d) The pilot-in-command shall, in accordance with the Technical Instructions, report without delay to the CAAT and the appropriate authority of the State of occurrence in the event of any dangerous goods accidents or incidents.
- (e) The pilot-in-command shall ensure that passengers are provided with information about dangerous goods in accordance with the Technical Instructions.
- (f) Reasonable quantities of articles and substances that would otherwise be classified as dangerous goods and that are used to facilitate flight safety, where carriage aboard the aircraft is advisable to ensure their timely availability for operational purposes, shall be considered authorised under paragraph 1;2.2.1(a) of the Technical Instructions. This is regardless of whether or not such articles and substances are required to be carried or intended to be used in connection with a particular flight.

The packing and loading on board of the above-mentioned articles and substances shall be performed, under the responsibility of the pilot in command, in such a way as to minimise the risks posed to crew members, passengers, cargo or the aircraft during aircraft operations.

NCO.GEN.145 Immediate reaction to a safety problem

The operator shall implement:

- (a) any safety measures mandated by the CAAT; and
- (b) any relevant mandatory safety information issued by the CAAT, including airworthiness directives.

NCO.GEN.150 Journey log

Particulars of the aircraft, its crew and each journey shall be retained for each flight, or series of flights, in the form of a journey log, or equivalent.

NCO.GEN.155 Minimum equipment list

- (a) An MEL may be established taking into account the following:
 - (1) the document shall provide for the operation of the aircraft, under specified conditions, with particular instruments, items of equipment or functions inoperative at the commencement of the flight;
 - (2) the document shall be prepared for each individual aircraft, taking account of the operator's relevant operational and maintenance conditions; and
 - (3) the MEL shall be based on the relevant Master Minimum Equipment List (MMEL), as established in accordance with certification requirements acceptable to the CAAT and shall not be less restrictive than the MMEL.
- (b) The MEL and any amendment thereto shall be notified to the CAAT.

SUBPART B: OPERATIONAL PROCEDURES

NCO.OP.100 Use of aerodromes and operating sites

The pilot-in-command shall only use aerodromes and operating sites that are adequate for the type of aircraft and operation concerned.

NCO.OP.101 Altimeter check and settings

- (a) The pilot-in-command shall check the proper operation of the altimeter before each departure.
- (b) The pilot-in-command shall use appropriate altimeter settings for all phases of flight, taking into account any procedure prescribed by the State of the aerodrome or the State of the airspace

NCO.OP.105

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NCO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

- (a) For instrument flight rules (IFR) flights, the pilot-in-command shall establish aerodrome operating minima for each departure, destination or alternate aerodrome that is planned to be used in order to ensure separation of the aircraft from terrain and obstacles and to mitigate the risk of loss of visual references during the visual flight segment of instrument approach operations
- (b) The aerodrome operating minima shall take the following elements into account, if relevant:
 - (1) the type, performance, and handling characteristics of the aircraft;
 - (2) the equipment available on the aircraft for the purpose of navigation, acquisition of visual references, and/or control of the flight path during take-off, approach, landing, and missed approach;
 - (3) any conditions or limitations stated in the aircraft flight manual (AFM);
 - (4) the dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;
 - (5) the adequacy and performance of the available visual and non-visual aids and infrastructure;
 - (6) the obstacle clearance altitude/height (OCA/H) for the instrument approach procedures (IAPs), if established;
 - (7) the obstacles in the climb-out areas and clearance margins;
 - (8) the competence and relevant operational experience of the pilot-in-command;
 - (9) the IAP, if established;
 - (10) the aerodrome characteristics and the type of air navigation services (ANS) available, if any;
 - (11) any minima that may be promulgated by the State of the aerodrome;
 - (12) the conditions prescribed in any specific approvals for low-visibility operations (LVOs) or operations with operational credits.

NCO.OP.111 Aerodrome operating minima — 2D and 3D approach operations

- (a) The decision height (DH) to be used for a 3D approach operation or a 2D approach operation flown with the continuous descent final approach (CDFA) technique shall not be lower than the highest of:

- (1) the obstacle clearance height (OCH) for the category of aircraft;
 - (2) the published approach procedure DH or minimum descent height (MDH), where applicable;
 - (3) the system minimum specified in Table 1;
 - (4) the minimum DH specified in the AFM or equivalent document, if stated.
- (b) The MDH for a 2D approach operation flown without the CDFA technique shall not be lower than the highest of:
- (1) the OCH for the category of aircraft;
 - (2) the published approach procedure MDH, where applicable;
 - (3) the system minimum specified in Table 1; or
 - (4) the minimum MDH specified in the AFM, if stated.

Table 1 System minima

Facility	Lowest DH/MDH (ft)
ILS/MLS/ GLS	200
GNSS/SBAS (LPV)	200
Precision approach radar (PAR)	200
GNSS/SBAS (LP)	250
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/VNAV)	250
Helicopter point-in-space approach	250
LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VHF omnidirectional radio range (VOR)	300
VOR/DME	250
Non-directional beacon (NDB)	350
NDB/DME	300
VHF direction finder (VDF)	350

NCO.OP.112 Aerodrome operating minima — circling operations with aeroplanes

- (a) The MDH for a circling approach operation with aeroplanes shall not be lower than the highest of:
 - (1) the published circling OCH for the aeroplane category;
 - (2) the minimum circling height derived from Table 1; or
 - (3) the DH/MDH of the preceding IAP.
- (b) The minimum visibility for a circling approach operation with aeroplanes shall be the highest of:
 - (1) the circling visibility for the aeroplane category, if published; or
 - (2) the minimum visibility derived from Table 1.

Table 1 MDH and minimum visibility for circling vs. aeroplane category

	Aeroplane category			
	A	B	C	D
MDH (ft)	400	500	600	700
Minimum Vis (m)	1500	1600	2400	3600

NCO.OP.113 Aerodrome operating minima — onshore circling operations with helicopters

The MDH for an onshore circling operation with helicopters shall not be lower than 250 ft and the meteorological visibility not less than 800 m.

NCO.OP.115 Departure and approach procedures — aeroplanes and helicopters

- (a) The pilot-in-command shall use the departure and approach procedures established by the State of the aerodrome, if such procedures have been published for the runway or FATO to be used.
- (b) The pilot-in-command may deviate from a published departure route, arrival route or approach procedure:
 - (1) provided obstacle clearance criteria can be observed, full account is taken of the operating conditions and any ATC clearance is adhered to; or
 - (2) when being radar-vectorred by an ATC unit.

NCO.OP.116 Performance-based navigation — aeroplanes and helicopters

The pilot-in-command shall ensure that, when PBN is required for the route or procedure to be flown:

- (a) the relevant PBN navigation specification is stated in the AFM or other document that has been approved by the certifying authority as part of an airworthiness assessment or is based on such approval; and
- (b) the aircraft is operated in conformance with the relevant navigation specification and limitations in the AFM or other document mentioned above.

NCO.OP.120 Noise abatement procedures — aeroplanes and helicopters

The pilot-in-command shall take into account published noise abatement procedures to minimise the effect of aircraft noise while ensuring that safety has priority over noise abatement.

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.

NCO.OP.130 Passenger briefing

The pilot-in-command shall ensure that before or, where appropriate, during the flight, passengers are given a briefing on emergency equipment and procedures.

NCO.OP.135 Flight preparation

- (a) Before commencing a flight, the pilot-in-command shall ascertain by every reasonable means available that the space-based facilities, ground and/or water facilities, including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the aircraft, are adequate for the type of operation under which the flight is to be conducted.

- (b) Before commencing a flight, the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under IFR, shall include:
- (1) a study of the available current meteorological reports and forecasts; and
 - (2) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of meteorological conditions.

NCO.OP.140 Destination alternate aerodromes — aeroplanes

For IFR flights, the pilot-in-command shall specify at least one destination alternate aerodrome in the flight plan, unless the available current meteorological information for the destination indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period, a ceiling of at least 1 000ft above the DH/MDH for an available instrument approach procedure (IAP) and a visibility of at least 5 000m.

NCO.OP.141 Destination alternate aerodromes — helicopters

For IFR flights, the pilot-in-command shall specify at least one destination alternate aerodrome in the flight plan, unless the available current meteorological information for the destination indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period, a ceiling of at least 1 000ft above the DH/MDH for an available IAP and a visibility of at least 3 000m.

NCO.OP.142 Destination aerodromes — instrument approach operations

The pilot-in-command shall only select an aerodrome as a destination alternate aerodrome if either:

- (a) an IAP that does not rely on GNSS is available either at the destination aerodrome or at a destination alternate aerodrome, or
- (b) all of the following conditions are met:
 - (1) the onboard GNSS equipment is SBAS-capable;
 - (2) the destination aerodrome, any destination alternate aerodrome, and the route between them are within SBAS service area;
 - (3) ABAS is predicted to be available in the event of the unexpected unavailability of SBAS;
 - (4) an IAP is selected (either at destination or destination alternate aerodrome) that does not rely on the availability of SBAS;
 - (5) an appropriate contingency action allows the flight to be completed safely in the event of unavailability of GNSS.

NCO.OP.143 Destination alternate aerodromes planning minima — aeroplanes

An aerodrome shall not be specified as a destination alternate aerodrome unless the available current meteorological information indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period:

- (a) for an alternate aerodrome with an available instrument approach operation with DH less than 250 ft,

- (1) a ceiling of at least 200 ft above the decision height (DH) or minimum descent height (MDH) associated with the instrument approach operation; and
- (2) a visibility of at least 1 500m; or
- (b) for an alternate aerodrome with an instrument approach operation with DH or MDH 250 ft or more,
 - (1) a ceiling of at least 400 ft above the DH or MDH associated with the instrument approach operation; and
 - (2) a visibility of at least 3 000m; or
- (c) for an alternate aerodrome without an IAP,
 - (1) a ceiling of at least the higher of 2 000ft and the minimum safe IFR height; and
 - (2) a visibility of at least 5 000m.

NCO.OP.144 Destination alternate aerodromes planning minima — helicopters

An aerodrome shall not be specified as a destination alternate aerodrome unless the available current meteorological information indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period,

- (a) for an alternate aerodrome with an IAP:
 - (1) a ceiling of at least 200 ft above the DH or MDH associated with the IAP; and
 - (2) a visibility of at least 1 500m by day or 3 000m by night; or
- (b) for an alternate aerodrome without an IAP:
 - (1) a ceiling of at least the higher of 2 000ft and the minimum safe IFR height; and
 - (2) a visibility of at least 1 500m by day or 3 000m by night

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

- (a) The aircraft shall not be refuelled with aviation gasoline (AVGAS) or wide-cut type fuel or a mixture of these types of fuel, when passengers are 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.

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

Refuelling with engine(s) and/or rotors turning shall only be conducted if all those conditions are met simultaneously:

- (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

NCO.OP.150 Carriage of passengers

The pilot-in-command shall ensure that, prior to and during taxiing, take-off and landing, and whenever deemed necessary in the interest of safety, each passenger on board occupies a seat or berth and has his/her safety belt or restraint device properly secured.

NCO.OP.155 Smoking on board — aeroplanes and helicopters

The pilot-in-command shall not allow smoking on board:

- (a) whenever considered necessary in the interest of safety; and
- (b) during refuelling of the aircraft.

NCO.OP.160 Meteorological conditions

- (a) The pilot-in-command shall only commence or continue a VFR flight if the latest available meteorological information indicates that the meteorological conditions along the route and at the intended destination at the estimated time of use will be at or above the applicable VFR operating minima.
- (b) The pilot-in-command shall only commence or continue an IFR flight towards the planned destination aerodrome if the latest available meteorological information indicates that, at the estimated time of arrival, the meteorological conditions at the destination or at least one destination alternate aerodrome are at or above the applicable aerodrome operating minima.
- (c) If a flight contains VFR and IFR segments, the meteorological information referred to in (a) and (b) shall be applicable as far as relevant.

NCO.OP.165 Ice and other contaminants — ground procedures

The pilot-in-command shall only commence take-off if the aircraft is clear of any deposit that might adversely affect the performance or controllability of the aircraft, except as permitted in the AFM.

NCO.OP.170 Ice and other contaminants — flight procedures

- (a) The pilot-in-command shall only commence a flight or intentionally fly into expected or actual icing conditions if the aircraft is certified and equipped to cope with such conditions as referred to in the air operations requirements of the Air Navigation Act B.E 2497 and Kingdom of Thailand Civil Aviation Regulations, including TCAR OPS.
- (b) If icing exceeds the intensity of icing for which the aircraft is certified or if an aircraft not certified for flight in known icing conditions encounters icing, the pilot-in-command shall exit the icing conditions without delay, by a change of level and/or route, and if necessary by declaring an emergency to ATC.

NCO.OP.175 Take-off conditions — aeroplanes and helicopters

Before commencing take-off, the pilot-in-command shall be satisfied that:

- (a) according to the information available, the meteorological conditions at the aerodrome or the operating site and the condition of the runway/FATO intended to be used will not prevent a safe take-off and departure; and
- (b) the selected aerodrome operating minima are consistent with all of the following:
 - (1) the operative ground equipment;
 - (2) the operative aircraft systems;
 - (3) the aircraft performance;
 - (4) flight crew qualifications.

NCO.OP.180 Simulated situations in flight

- (a) The pilot-in-command shall, when carrying passengers or cargo, not simulate:
 - (1) situations that require the application of abnormal or emergency procedures; or
 - (2) flight in instrument meteorological conditions (IMC).
- (b) Notwithstanding (a), when training flights are conducted by an approved training organisation, referred to in TCAR PEL such situations may be simulated with student pilots on-board.

NCO.OP.185 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.

NCO.OP.190 Use of supplemental oxygen

- (a) The pilot-in-command shall ensure that all flight crew members engaged in performing duties essential to the safe operation of an aircraft in flight use supplemental oxygen continuously whenever he/she determines that at the altitude of the intended flight the lack of oxygen might result in impairment of the faculties of crew members, and shall ensure that supplemental oxygen is available to passengers when lack of oxygen might harmfully affect passengers.
- (b) In any other case when the pilot-in-command cannot determine how the lack of oxygen might affect all occupants on board, he/she shall ensure that:
 - (1) all crew members engaged in performing duties essential to the safe operation of an aircraft in flight use supplemental oxygen for any period in excess of 30 minutes when the pressure altitude in the the passenger compartment will be between 10 000 ft and 13 000 ft; and
 - (2) all occupants use supplemental oxygen for any period that the pressure altitude in the the passenger compartment will be above 13 000 ft.

NCO.OP.195 Ground proximity detection

When undue proximity to the ground is detected by the pilot-in-command or by a ground proximity warning system, the pilot-in-command shall take corrective action immediately in order to establish safe flight conditions.

NCO.OP.200 Airborne collision avoidance system (ACAS II)

When ACAS II is used, operational procedures and training shall be in accordance with Kingdom of Thailand Civil Aviation Regulations and other relevant national provisions.

NCO.OP.205 Approach and landing conditions — aeroplanes and helicopters

Before commencing an approach to land, the pilot-in-command shall be satisfied that:

- (a) according to the information available, the meteorological conditions at the aerodrome or the operating site, and the condition of the runway intended to be used will not prevent a safe approach, landing, or missed approach; and
- (b) the selected aerodrome operating minima are consistent with all of the following:
 - (1) the operative ground equipment;
 - (2) the operative aircraft systems;
 - (3) the aircraft performance, and
 - (4) flight crew qualifications.

NCO.OP.206 Approach and landing conditions — helicopters

Before commencing an approach to land, the pilot-in-command shall be satisfied that:

- (a) according to the information available, the meteorological conditions at the aerodrome or the operating site and the condition of the final approach and take-off area (FATO) intended to be used will not prevent a safe approach, landing or missed approach; and
- (b) the selected aerodrome operating minima are consistent with all of the following:

- (1) the operative ground equipment;
- (2) the operative aircraft systems;
- (3) the aircraft performance;
- (4) flight crew qualifications.

NCO.OP.210 Commencement and continuation of approach — aeroplanes and helicopters

- (a) If the controlling RVR for the runway to be used for landing is less than 550 m (or any lower value established in accordance with an approval under SPA.LVO), then an instrument approach operation shall not be continued:
 - (1) past a point at which the aircraft is 1 000ft above the aerodrome elevation; or
 - (2) into the final approach segment if the DH or MDH is higher than 1 000ft.
- (b) If the required visual reference is not established, a missed approach shall be executed at or before the DA/H or the MDA/H.
- (c) If the required visual reference is not maintained after DA/H or MDA/H, a go-around shall be executed promptly.'..

NCO.OP.220 Airborne collision avoidance system (ACAS II)

When ACAS II is used, pilot-in-command shall apply the appropriate operational procedures and be adequately trained.

SUBPART C: AIRCRAFT PERFORMANCE AND OPERATING LIMITATIONS

NCO.POL.100 Operating limitations — all aircraft

- (a) During any phase of operation, the loading, the mass and the centre of gravity (CG) position of the aircraft shall comply with any limitation specified in the AFM or equivalent document.
- (b) Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the AFM for visual presentation, shall be displayed in the aircraft.

NCO.POL.105 Weighing

- (a) The operator shall ensure that the mass and the CG of the aircraft have been established by actual weighing prior to the initial entry into service of the aircraft. The accumulated effects of modifications and repairs on the mass and balance shall be accounted for and properly documented. Such information shall be made available to the pilot-in-command. The aircraft shall be reweighed if the effect of modifications on the mass and balance is not accurately known.
- (b) The weighing shall be accomplished by the manufacturer of the aircraft or by an approved maintenance organisation

NCO.POL.110 Performance — general

The pilot-in-command shall only operate the aircraft if the performance is adequate to comply with the applicable rules of the air and any other restrictions applicable to the flight, the airspace or the aerodromes or operating sites used, taking into account the charting accuracy of any charts and maps used.

SUBPART D: INSTRUMENTS, DATA AND EQUIPMENT

SECTION 1 Aeroplanes

NCO.IDE.A.100 Instruments and equipment — general

- (a) Instruments and equipment required by this Subpart shall be approved in accordance with the applicable airworthiness requirements if they are:
- (1) used by the flight crew to control the flight path;
 - (2) used to comply with NCO.IDE.A.190;
 - (3) used to comply with NCO.IDE.A.195; or
 - (4) installed in the aeroplane.
- (b) The following items, when required by this Subpart, do not need an equipment approval:
- (1) spare fuses;
 - (2) independent portable lights;
 - (3) an accurate time piece;
 - (4) first-aid kit;
 - (5) survival and signalling equipment;
 - (6) sea anchor and equipment for mooring;
 - (7) child restraint device.
 - (8) a simple PCDS used by a task specialist as a restraint device.
- (c) Instruments and equipment not required under Part NCO by this Subpart as well as any other equipment that is not required by other applicable TCAR OPS Parts, but is carried on a flight, shall comply with the following:
- (1) the information provided by these instruments or equipment shall not be used by the flight crew to comply with the requirements of the Air Navigation Act B.E 2497, Kingdom of Thailand Civil Aviation Regulations or NCO.IDE.A.190 and NCO.IDE.A.195; and
 - (2) the instruments and equipment shall not affect the airworthiness of the aeroplane, even in the case of failures or malfunction.
- (d) Instruments and equipment shall be readily operable or accessible from the station where the flight crew member that needs to use it is seated.
- (e) All required emergency equipment shall be easily accessible for immediate use.

NCO.IDE.A.105 Minimum equipment for flight

A flight shall not be commenced when any of the aeroplane instruments, items of equipment or functions required for the intended flight are inoperative or missing, unless:

- (a) the aeroplane is operated in accordance with the MEL, if established; or
- (b) the aeroplane is subject to a permit to fly issued in accordance with the applicable airworthiness requirements.

NCO.IDE.A.110 Spare electrical fuses

Aeroplanes shall be equipped with spare electrical fuses, of the ratings required for complete circuit protection, for replacement of those fuses that are allowed to be replaced in flight.

NCO.IDE.A.115 Operating lights

Aeroplanes operated at night shall be equipped with:

- (a) an anti-collision light system;
- (b) navigation/position lights;
- (c) a landing light;
- (d) lighting supplied from the aeroplane's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the aeroplane;
- (e) lighting supplied from the aeroplane's electrical system to provide illumination in all passenger compartments;
- (f) an independent portable light for each crew member station; and
- (g) lights to conform with the International Regulations for Preventing Collisions at Sea if the aeroplane is operated as a seaplane.

NCO.IDE.A.120 Operations under VFR — flight and navigational instruments and associated equipment

- (a) Aeroplanes operated under VFR by day shall be equipped with a means of measuring and displaying the following:
 - (1) magnetic heading;
 - (2) time, in hours, minutes and seconds;
 - (3) barometric altitude;
 - (4) indicated airspeed; and
 - (5) Mach number, whenever speed limitations are expressed in terms of Mach number.
- (b) Aeroplanes operated under visual meteorological conditions (VMC) at night, or in conditions where the aeroplane cannot be maintained in a desired flight path without reference to one or more additional instruments, shall be, in addition to (a), equipped with:
 - (1) a means of measuring and displaying the following:
 - (i) turn and slip;
 - (ii) attitude;
 - (iii) vertical speed; and
 - (iv) stabilised heading;and
 - (2) a means of indicating when the supply of power to the gyroscopic instruments is not adequate.

- (c) Aeroplanes operated in conditions where they cannot be maintained in a desired flight path without reference to one or more additional instruments, shall be, in addition to (a) and (b), equipped with a means of preventing malfunction of the airspeed indicating system required in (a)(4) due to condensation or icing.

NCO.IDE.A.125 Operations under IFR — flight and navigational instruments and associated equipment

Aeroplanes operated under IFR shall be equipped with:

- (a) a means of measuring and displaying the following:
- (1) magnetic heading;
 - (2) time in hours, minutes and seconds;
 - (3) barometric altitude;
 - (4) indicated airspeed;
 - (5) vertical speed;
 - (6) turn and slip;
 - (7) attitude;
 - (8) stabilised heading;
 - (9) outside air temperature; and
 - (10) Mach number, whenever speed limitations are expressed in terms of Mach number;
- (b) a means of indicating when the supply of power to the gyroscopic instruments is not adequate; and
- (c) a means of preventing malfunction of the airspeed indicating system required in (a)(4) due to condensation or icing.

NCO.IDE.A.130 Terrain awareness warning system (TAWS)

Turbine-powered aeroplanes certified for a maximum passenger seating configuration of more than nine shall be equipped with a TAWS that meets the requirements for:

- (a) class A equipment, as specified in an acceptable standard, in the case of aeroplanes for which the individual certificate of airworthiness (CofA) was first issued after 1 January 2011; or
- (b) class B equipment, as specified in an acceptable standard, in the case of aeroplanes for which the individual CofA was first issued on or before 1 January 2011.

NCO.IDE.A.135 Flight crew interphone system

Aeroplanes operated by more than one flight crew member shall be equipped with a flight crew interphone system, including headsets and microphones for use by all flight crew members.

NCO.IDE.A.140 Seats, seat safety belts, restraint systems and child restraint devices

- (a) Aeroplanes shall be equipped with:
- (1) a seat or berth for each person on board who is aged 24 months or more;
 - (2) a seat belt on each seat and restraining belts for each berth;

- (3) a child restraint device (CRD) for each person on board younger than 24 months; and
- (4) a seat belt with upper torso restraint system on each flight crew seat, having a single point release for aeroplanes having a CofA first issued on or after 25 August 2016.

NCO.IDE.A.145 First-aid kit

- (a) Aeroplanes shall be equipped with a first-aid kit.
- (b) The first-aid kit shall be:
 - (1) readily accessible for use; and
 - (2) kept up-to-date.

NCO.IDE.A.150 Supplemental oxygen — pressurised aeroplanes

- (a) Pressurised aeroplanes operated at flight altitudes for which the oxygen supply is required in accordance with (b) shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the required oxygen supplies.
- (b) Pressurised aeroplanes operated above flight altitudes at which the pressure altitude in the passenger compartments is above 10 000 ft shall carry enough breathing oxygen to supply:
 - (1) all crew members and:
 - (i) 100 % of the passengers for any period when the cabin pressure altitude exceeds 15 000 ft, but in no case less than 10 minutes' supply;
 - (ii) at least 30 % of the passengers, for any period when, in the event of loss of pressurisation and taking into account the circumstances of the flight, the pressure altitude in the passenger compartment will be between 14 000 ft and 15 000 ft; and
 - (iii) at least 10 % of the passengers for any period in excess of 30 minutes when the pressure altitude in the passenger compartment will be between 10 000 ft and 14 000 ft;
 - and
 - (2) all the occupants of the passenger compartment for no less than 10 minutes, in the case of aeroplanes operated at pressure altitudes above 25 000 ft, or operated below that altitude but under conditions that will not allow them to descend safely to a pressure altitude of 13 000 ft within 4 minutes.
- (c) Pressurised aeroplanes operated at flight altitudes above 25 000 ft shall, in addition, be equipped with a device to provide a warning indication to the flight crew of any loss of pressurisation.

NCO.IDE.A.155 Supplemental oxygen — non-pressurised aeroplanes

Non-pressurised aeroplanes operated when an oxygen supply is required in accordance with NCO.OP.190 shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the required oxygen supplies.

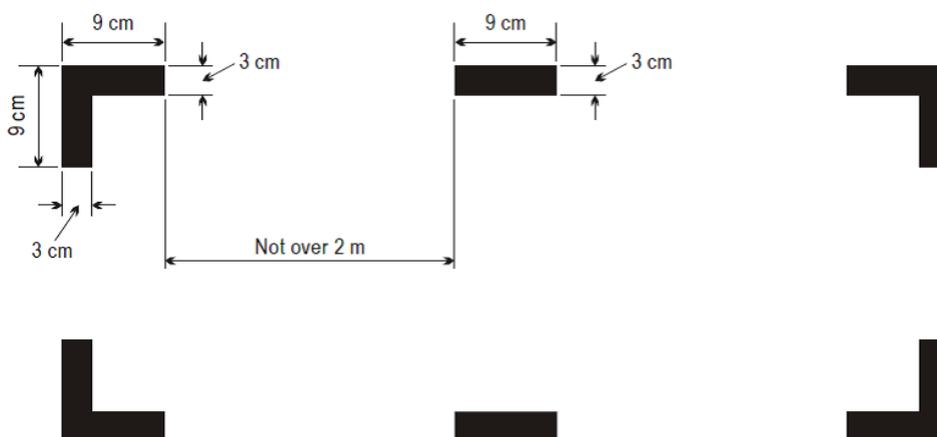
NCO.IDE.A.160 Hand fire extinguishers

- (a) Aeroplanes, except aeroplanes less than MTOW of 1200kg, shall be equipped with at least one hand fire extinguisher:
 - (1) in the flight crew compartment; and
 - (2) in each passenger compartment that is separate from the flight crew compartment, except if the compartment is readily accessible to the flight crew.
- (b) The type and quantity of extinguishing agent for the required fire extinguishers shall be suitable for the type of fire likely to occur in the compartment where the extinguisher is intended to be used and to minimise the hazard of toxic gas concentration in compartments occupied by persons.

NCO.IDE.A.165 Marking of break-in points

If areas of the aeroplane’s fuselage suitable for break-in by rescue crews in an emergency are marked, such areas shall be marked as shown in Figure 1.

Figure 1
Marking of break-in points



NCO.IDE.A.170 Emergency locator transmitter (ELT)

- (a) Aeroplanes shall be equipped with:
 - (1) an ELT of any type, when first issued with an individual CofA on or before 1 July 2008;
 - (2) an automatic ELT, when first issued with an individual CofA after 1 July 2008; or
 - (3) a survival ELT (ELT(S)) or a personal locator beacon (PLB), carried by a crew member or a passenger, when certified for a maximum passenger seating configuration of six or less.
- (b) ELTs of any type and PLBs shall be capable of transmitting simultaneously on 121,5 MHz and 406 MHz.

NCO.IDE.A.175 Flight over water

- (a) The following aeroplanes shall be equipped with a life-jacket for each person on board, or equivalent individual floatation device for each person on board younger than 24 months, that shall be worn or stowed in a position that is readily accessible from the seat or berth of the person for whose use it is provided:
 - (1) single-engined landplanes when:
 - (i) flying over water beyond gliding distance from land; or
 - (ii) taking off or landing at an aerodrome or operating site where, in the opinion of the pilot-in-command, the take-off or approach path is so disposed over water that there would be a likelihood of a ditching;
 - (2) seaplanes operated over water; and
 - (3) aeroplanes operated at a distance away from land where an emergency landing is possible greater than that corresponding to 30 minutes at normal cruising speed or 50 NM, whichever is less.
- (b) Seaplanes operated over water shall be equipped with:
 - (1) one anchor;
 - (2) one sea anchor (drogue), when necessary to assist in manoeuvring; and
 - (3) equipment for making the sound signals, as prescribed in the International Regulations for Preventing Collisions at Sea, where applicable.
- (c) The pilot-in-command of an aeroplane operated at a distance away from land where an emergency landing is possible greater than that corresponding to 30 minutes at normal cruising speed or 50 NM, whichever is the lesser, shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching, based on which he/she shall determine the carriage of:
 - (1) equipment for making the distress signals;
 - (2) life-rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency; and
 - (3) life-saving equipment, to provide the means of sustaining life, as appropriate to the flight to be undertaken.

NCO.IDE.A.180 Survival equipment

Aeroplanes operated over areas in which search and rescue would be especially difficult shall be equipped with such signalling devices and life-saving equipment, including means of sustaining life, as may be appropriate to the area overflown.

NCO.IDE.A.190 Radio communication equipment

- (a) Where required by the airspace being flown aeroplanes shall be equipped with radio communication equipment capable of conducting two-way communication with those aeronautical stations and on those frequencies to meet airspace requirements.
- (b) Radio communication equipment, if required by (a), shall provide for communication on the aeronautical emergency frequency 121,5 MHz.
- (c) When more than one communication equipment unit is required, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.
- (d) For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aeroplane shall be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s)

NCO.IDE.A.195 Navigation equipment

- (a) Aeroplanes operated over routes that cannot be navigated by reference to visual landmarks shall be equipped with any navigation equipment necessary to enable them to proceed in accordance with:
 - (ii) the ATS flight plan; if applicable; and
 - (iii) the applicable airspace requirements.
- (b) Aeroplanes shall have sufficient navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment shall allow safe navigation in accordance with (a), or an appropriate contingency action, to be completed safely.
- (c) Aeroplanes operated on flights in which it is intended to land in IMC shall be equipped with suitable equipment capable of providing guidance to a point from which a visual landing can be performed. This equipment shall be capable of providing such guidance for each aerodrome at which it is intended to land in IMC and for any designated alternate aerodromes.
- (d) For PBN operations the aircraft shall meet the airworthiness certification requirements for the appropriate navigation specification.
- (e) Aeroplanes shall be equipped with surveillance equipment in accordance with the applicable airspace requirements.

NCO.IDE.A.200 Transponder

Where required by the airspace being flown, aeroplanes shall be equipped with a secondary surveillance radar (SSR) transponder with all the required capabilities.

NCO.IDE.A.205 Management of aeronautical databases

- (a) Aeronautical databases used on certified aircraft system applications shall meet data quality requirements that are adequate for the intended use of the data.
- (b) The pilot-in-command shall ensure the timely distribution and insertion of current and unaltered aeronautical databases to the aircraft that require them.
- (c) Notwithstanding any other occurrence reporting requirements as defined in the Kingdom of Thailand Civil Aviation Occurrence reporting Regulation, or other national provisions the pilot-in-command shall report to the database provider instances of erroneous, inconsistent or missing data that might be reasonably expected to constitute a hazard to flight.

In such cases, the pilot-in-command shall not use the affected data.

NCO.IDE.A.210 Surveillance Equipment

- (a) An aeroplane shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services
- (b) For operations where surveillance equipment is required to meet RSP specification for performance-based surveillance (PBS), an aeroplane shall, in addition to the requirement specified at (a):
 - (i) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

SECTION 2 Helicopters

NCO.IDE.H.100 Instruments and equipment — general

- (a) Instruments and equipment required by this Subpart shall be approved in accordance with the applicable airworthiness requirements if they are:
- (1) used by the flight crew to control the flight path;
 - (2) used to comply with NCO.IDE.H.190;
 - (3) used to comply with NCO.IDE.H.195; or
 - (4) installed in the helicopter.
- (b) The following items, when required under this Subpart, do not need an equipment approval:
- (1) independent portable lights;
 - (2) an accurate time piece;
 - (3) first-aid kit;
 - (4) survival and signalling equipment;
 - (5) sea anchor and equipment for mooring; and
 - (6) child restraint device.
 - (7) a simple PCDS used by a task specialist as a restraint device.
- (c) Instruments and equipment not required under Part NCO, as well as any other equipment that is not required under TCAR OPS Parts, but carried on a flight, shall comply with the following requirements:
- (1) the information provided by these instruments or equipment shall not be used by the flight crew to comply with the requirements of the Air Navigation Act B.E 2497, Kingdom of Thailand Civil Aviation Regulations or NCO.IDE.H.190 and NCO.IDE.H.195; and
 - (2) the instruments and equipment shall not affect the airworthiness of the helicopter, even in the case of failures or malfunction.
- (d) Instruments and equipment shall be readily operable or accessible from the station where the flight crew member that needs to use it is seated.
- (e) All required emergency equipment shall be easily accessible for immediate use.

NCO.IDE.H.105 Minimum equipment for flight

A flight shall not be commenced when any of the helicopter's instruments, items of equipment or functions required for the intended flight are inoperative or missing, unless:

- (a) the helicopter is operated in accordance with the MEL, if established; or
- (b) the helicopter is subject to a permit to fly issued in accordance with the applicable airworthiness requirements.

NCO.IDE.H.115 Operating lights

Helicopters operated at night shall be equipped with:

- (a) an anti-collision light system;
- (b) navigation/position lights;
- (c) a landing light;
- (d) lighting supplied from the helicopter's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the helicopter;
- (e) lighting supplied from the helicopter's electrical system to provide illumination in all passenger compartments;
- (f) an independent portable light for each crew member station; and
- (g) lights to conform with the International Regulations for Preventing Collisions at Sea if the helicopter is amphibious.

NCO.IDE.H.120 Operations under VFR — flight and navigational instruments and associated equipment

- (a) Helicopters operated under VFR by day shall be equipped with a means of measuring and displaying the following:
 - (1) magnetic heading;
 - (2) time in hours, minutes and seconds;
 - (3) barometric altitude;
 - (4) indicated airspeed; and
 - (5) slip.
- (b) Helicopters operated under VMC at night, or when the visibility is less than 1 500 m, or in conditions where the helicopter cannot be maintained in a desired flight path without reference to one or more additional instruments, shall be, in addition to (a), equipped with:
 - (1) a means of measuring and displaying the following:
 - (i) attitude;
 - (ii) vertical speed; and
 - (iii) stabilised heading; and
 - (2) a means of indicating when the supply of power to the gyroscopic instruments is not adequate.
- (c) Helicopters operated when the visibility is less than 1 500 m, or in conditions where the helicopter cannot be maintained in a desired flight path without reference to one or more additional instruments, shall be, in addition to (a) and (b), equipped with a means of preventing malfunction of the airspeed indicating system required in (a)(4) due to condensation or icing.

NCO.IDE.H.125 Operations under IFR — flight and navigational instruments and associated equipment

Helicopters operated under IFR shall be equipped with:

- (a) a means of measuring and displaying the following:
 - (1) magnetic heading;
 - (2) time in hours, minutes and seconds;
 - (3) barometric altitude;
 - (4) indicated airspeed;
 - (5) vertical speed;
 - (6) slip;
 - (7) attitude;
 - (8) stabilised heading; and
 - (9) outside air temperature;
- (b) a means of indicating when the supply of power to the gyroscopic instruments is not adequate;
- (c) a means of preventing malfunction of the airspeed indicating system required by (a)(4) due to condensation or icing; and
- (d) an additional means of measuring and displaying attitude as a standby instrument.

NCO.IDE.H.126 Additional equipment for single pilot operations under IFR

Helicopters operated under IFR with a single pilot shall be equipped with an autopilot with at least altitude hold and heading mode.

NCO.IDE.H.135 Flight crew interphone system

Helicopters operated by more than one flight crew member shall be equipped with a flight crew interphone system, including headsets and microphones for use by all flight crew members.

NCO.IDE.H.140 Seats, seat safety belts, restraint systems and child restraint devices

- (a) Helicopters shall be equipped with:
 - (1) a seat or berth for each person on board who is aged 24 months or more, or a station for each crew member or task specialist on board;
 - (2) a seat belt on each passenger seat and restraining belts for each berth, and restraint devices for each station;
 - (3) for helicopters first issued with an individual CofA after 31 December 2012, a seat belt with an upper torso restraint system for each passenger who is aged 24 months or more;
 - (4) a child restraint device for each person on board younger than 24 months; and
 - (5) a seat belt with upper torso restraint system incorporating a device that will automatically restrain the occupant's torso in the event of rapid deceleration on each flight crew seat.
- (b) A seat belt with upper torso restraint system shall have a single point release.

NCO.IDE.H.145 First-aid kit

- (a) Helicopters shall be equipped with a first-aid kit.
- (b) The first-aid kit shall be:
 - (1) readily accessible for use; and
 - (2) kept up-to-date.

NCO.IDE.H.155 Supplemental oxygen — non-pressurised helicopters

Non-pressurised helicopters operated when an oxygen supply is required in accordance with NCO.OP.190 shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the required oxygen supplies.

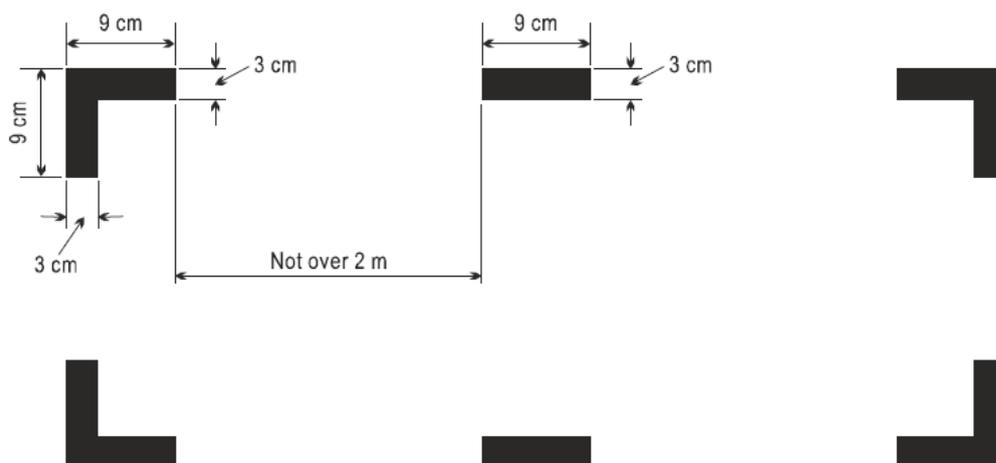
NCO.IDE.H.160 Hand fire extinguishers

- (a) Helicopters, shall be equipped with at least one hand fire extinguisher:
 - (1) in the flight crew compartment; and
 - (2) in each passenger compartment that is separate from the flight crew compartment, except if the compartment is readily accessible to the flight crew.
- (b) The type and quantity of extinguishing agent for the required fire extinguishers shall be suitable for the type of fire likely to occur in the compartment where the extinguisher is intended to be used and to minimise the hazard of toxic gas concentration in compartments occupied by persons.

NCO.IDE.H.165 Marking of break-in points

If areas of the helicopter’s fuselage suitable for break-in by rescue crews in an emergency are marked, such areas shall be marked as shown in Figure 1.

Figure 1 Marking of break-in points



NCO.IDE.H.170 Emergency locator transmitter (ELT)

- (a) Helicopters certified for a maximum passenger seating configuration above six shall be equipped with:
 - (1) an automatic ELT; and
 - (2) one survival ELT (ELT(S)) in a life-raft or life-jacket when the helicopter is operated at a distance from land corresponding to more than 3 minutes flying time at normal cruising speed.
- (b) Helicopters certified for a maximum passenger seating configuration of six or less shall be equipped with an ELT(S) or a personal locator beacon (PLB), carried by a crew member or a passenger.
- (c) ELTs of any type and PLBs shall be capable of transmitting simultaneously on 121,5 MHz and 406 MHz.

NCO.IDE.H.175 Flight over water

- (a) Helicopters shall be equipped with a life-jacket for each person on board or equivalent individual flotation device for each person on board younger than 24 months, which shall be worn or stowed in a position that is readily accessible from the seat or berth of the person for whose use it is provided, when:
 - (1) flying over water beyond autorotational distance from land where in case of the critical engine failure, the helicopter is not able to sustain level flight; or
 - (2) flying over water at a distance of land corresponding to more than 10 minutes flying at normal cruising speed, where in case of the critical engine failure, the helicopter is able to sustain level flight; or
 - (3) taking off or landing at an aerodrome/operating site where the take-off or approach path is over water.
- (b) Each life-jacket or equivalent individual flotation device shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.
- (c) The pilot-in-command of a helicopter operated on a flight over water at a distance from land corresponding to more than 30 minutes flying time at normal cruising speed or 50 NM, whichever is less, shall determine the risks to survival of the occupants of the helicopter in the event of a ditching, based on which he/she shall determine the carriage of:
 - (1) equipment for making the distress signals;
 - (2) life-rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency; and
 - (3) life-saving equipment, to provide the means of sustaining life, as appropriate to the flight to be undertaken.
- (d) The pilot-in-command shall determine the risks to survival of the occupants of the helicopter in the event of a ditching, when deciding if the life-jackets required in (a) shall be worn by all occupants.

NCO.IDE.H.180 Survival equipment

Helicopters, operated over areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment, including means of sustaining life, as may be appropriate to the area overflown.

NCO.IDE.H.185 All helicopters on flights over water — ditching

Helicopters flying over water in a hostile environment beyond a distance of 50 NM from land shall be either of the following:

- (a) designed for landing on water in accordance with the relevant certification specifications;
- (b) certified for ditching in accordance with the relevant certification specifications; or
- (c) fitted with emergency flotation equipment.

NCO.IDE.H.190 Radio communication equipment

- (a) Where required by the airspace being flown helicopters shall be equipped with radio communication equipment capable of conducting two-way communication with those aeronautical stations and on those frequencies to meet airspace requirements.
- (b) Radio communication equipment, if required by (a), shall provide for communication on the aeronautical emergency frequency 121,5 MHz.
- (c) When more than one communications equipment unit is required, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.
- (d) When a radio communication system is required, and in addition to the flight crew interphone system required in NCO.IDE.H.135, helicopters shall be equipped with a transmit button on the flight controls for each required pilot and/or crew member at his/her working station.
- (e) For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aeroplane shall be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s)

NCO.IDE.H.195 Navigation equipment

- (a) Helicopters operated over routes that cannot be navigated by reference to visual landmarks shall be equipped with navigation equipment that will enable them to proceed in accordance with:
 - (1) the ATS flight plan, if applicable; and
 - (2) the applicable airspace requirements.
- (b) Helicopters shall have sufficient navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment shall allow safe navigation in accordance with (a), or an appropriate contingency action, to be completed safely.
- (c) Helicopters operated on flights in which it is intended to land in IMC shall be equipped with navigation equipment capable of providing guidance to a point from which a visual landing can be performed. This equipment shall be capable of providing such guidance for each aerodrome at which is intended to land in IMC and for any designated alternate aerodromes.
- (d) For PBN operations the aircraft shall meet the airworthiness certification requirements for the appropriate navigation specification;
- (e) Helicopters shall be equipped with surveillance equipment in accordance with the applicable airspace requirements.

NCO.IDE.H.200 Transponder

Where required by the airspace being flown, helicopters shall be equipped with a secondary surveillance radar (SSR) transponder with all the required capabilities.

NCO.IDE.H.205 Management of aeronautical databases

- (a) Aeronautical databases used on certified aircraft system applications shall meet data quality requirements that are adequate for the intended use of the data.
- (b) The pilot-in-command shall ensure the timely distribution and insertion of current and unaltered aeronautical databases to the aircraft that require them.
- (c) Notwithstanding any other occurrence reporting requirements as defined in the Kingdom of Thailand Civil Aviation Occurrence reporting Regulation, or other national provisions the pilot-in-command shall report to the database provider instances of erroneous, inconsistent or missing data that might be reasonably expected to constitute a hazard to flight.

In such cases, the pilot-in-command shall not use the affected data.

NCO.IDE.H.210 Surveillance Equipment

- (a) An helicopter shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services
- (b) For operations where surveillance equipment is required to meet RSP specification for performance-based surveillance (PBS), an aeroplane shall, in addition to the requirement specified at (a):
 - (i) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

SUBPART E: SPECIFIC REQUIREMENTS

SECTION 1 General

NCO.SPEC.100 Scope

This subpart establishes specific requirements to be followed by a pilot-in-command conducting non-commercial specialised operations with other-than complex motor-powered aircraft.

NCO.SPEC.105 Checklist

- (a) Before commencing a specialised operation, the pilot-in-command shall conduct a risk assessment, assessing the complexity of the activity to determine the hazards and associated risks inherent in the operation and establish mitigating measures.
- (b) A specialised operation shall be performed in accordance with a checklist. Based on the risk assessment, the pilot-in-command shall establish such checklist appropriate to the specialised activity and aircraft used, taking account of any section of this subpart.
- (c) The checklist that is relevant to the duties of the pilot-in-command, crew members and task specialists shall be readily accessible on each flight.
- (d) The checklist shall be regularly reviewed and updated, as appropriate.

NCO.SPEC.110 Pilot-in-command responsibilities and authority

Whenever crew members or task specialists are involved in the operation, the pilot-in-command shall

- (a) ensure compliance of crew members and task specialists with NCO.SPEC.115 and NCO.SPEC.120;
- (b) not commence a flight if any crew member or task specialist is incapacitated from performing duties by any cause such as injury, sickness, fatigue or the effects of any psychoactive substance;
- (c) not continue a flight beyond the nearest weather-permissible aerodrome or operating site when any crew member or task specialist's capacity to perform duties is significantly reduced from causes such as fatigue, sickness or lack of oxygen;
- (d) ensure that crew members and task specialists comply with the laws, regulations and procedures of those States where operations are conducted;
- (e) ensure that all crew members and task specialists are able to communicate with each other in a common language; and
- (f) ensure that task specialists and crew members use supplemental oxygen continuously whenever he/she determines that at the altitude of the intended flight the lack of oxygen might result in impairment of the faculties of crew members or harmfully affect task specialists. If the pilot-in-command cannot determine how the lack of oxygen might affect the occupants on board, he/she shall ensure that task specialists and crew members use supplemental oxygen continuously whenever the cabin altitude exceeds 10 000 ft for a period of more than 30 minutes and whenever the cabin altitude exceeds 13 000 ft.

NCO.SPEC.115 Crew responsibilities

- (a) The crew member shall be responsible for the proper execution of his/her duties. Crew duties shall be specified in the checklist.
- (b) During critical phases of the flight or whenever deemed necessary by the pilot-in-command in the interest of safety, the crew member shall be restrained at his/her assigned station, unless otherwise specified in the checklist.
- (c) During flight, the flight crew member shall keep his/her safety belt fastened while at his/her station.
- (d) During flight, at least one qualified flight crew member shall remain at the controls of the aircraft at all times.
- (e) The crew member shall not undertake duties on an aircraft:
 - (1) if he/she knows or suspects that he/she is suffering from fatigue as referred to in latest revision of the 'Notification of the Civil Aviation Authority of Thailand on Flight Time and Flight Duty Period Limitations B.E. 2559' and TCAR OPS, as they may be applicable or feels otherwise unfit to perform his/her duties; or
 - (2) when under the influence of psychoactive substances or alcohol or for other reasons as referred to in TCAR OPS and other applicable Kingdom of Thailand Civil Aviation Regulations.
- (f) The crew member who undertakes duties for more than one operator shall:
 - (1) maintain his/her individual records regarding flight and duty times and rest periods as referred to in TCAR OPS Part ORO, Subpart FTL, if applicable; and
 - (2) provide each operator with the data needed to schedule activities in accordance with the applicable FTL requirements.
- (g) The crew member shall report to the pilot-in-command:
 - (1) any fault, failure, malfunction or defect, which he/she believes may affect the airworthiness or safe operation of the aircraft, including emergency systems; and
 - (2) any incident that was endangering, or could endanger, the safety of the operation.

NCO.SPEC.120 Task specialists responsibilities

- (a) The task specialist shall be responsible for the proper execution of his/her duties. Task specialists' duties shall be specified in the checklist.
- (b) During critical phases of the flight or whenever deemed necessary by the pilot-in-command in the interest of safety, the task specialist shall be restrained at his/her assigned station, unless otherwise specified in the checklist.
- (c) The task specialist shall ensure that he/she is restrained when carrying out specialised tasks with external doors opened or removed.
- (d) The task specialist shall report to the pilot-in-command:
 - (1) any fault, failure, malfunction or defect, which he/she believes may affect the airworthiness or safe operation of the aircraft, including emergency systems; and
 - (2) any incident that was endangering, or could endanger, the safety of the operation.

NCO.SPEC.125 Safety briefing

- (a) Before take-off, the pilot-in-command shall brief task specialists on:
 - (1) emergency equipment and procedures;
 - (2) operational procedures associated with the specialised task before each flight or series of flights.
- (b) The briefing referred to in (a)(2) may not be required if task specialists have been instructed on the operational procedures before the start of the operating season in that calendar year.

NCO.SPEC.130 Minimum obstacle clearance altitudes — IFR flights

The pilot-in-command shall establish minimum flight altitudes for each flight providing the required terrain clearance for all route segments to be flown in IFR. The minimum flight altitudes shall not be lower than those published by the State overflown.

NCO.SPEC.145 Simulated situations in flight

Unless a task specialist is on-board the aircraft for training, the pilot-in-command shall, when carrying task specialists, not simulate:

- (a) situations that require the application of abnormal or emergency procedures; or
- (b) flight in instrument meteorological conditions (IMC).

NCO.SPEC.150 Ground proximity detection

If installed, the ground proximity warning system may be disabled during those specialised tasks, which by their nature require the aircraft to be operated within a distance from the ground below that which would trigger the ground proximity warning system.

NCO.SPEC.155 Airborne collision avoidance system (ACAS II)

Notwithstanding NCO.OP.200, the ACAS II may be disabled during those specialised tasks, which by their nature require the aircraft to be operated within a distance from each other below that which would trigger the ACAS.

NCO.SPEC.160 Release of dangerous goods

The pilot-in-command shall not operate an aircraft over congested areas of cities, towns or settlements or over an open-air assembly of persons when releasing dangerous goods.

NCO.SPEC.165 Carriage and use of weapons

- (a) The pilot-in-command shall ensure that, when weapons are carried on a flight for the purpose of a specialised task, these are secured when not in use.
- (b) The task specialist using the weapon shall take all necessary measures to prevent the aircraft and persons on board or on the ground from being endangered.

NCO.SPEC.170 Performance and operating criteria — aeroplanes

When operating an aeroplane at a height of less than 150 m (500 ft) above a non-congested area, for operations of aeroplanes that are not able to sustain level flight in the event of a critical engine failure, the pilot-in-command shall have:

- (a) established operational procedures to minimise the consequences of an engine failure; and
- (b) briefed all crew members and task specialists on board on the procedures to be carried out in the event of a forced landing.

NCO.SPEC.175 Performance and operating criteria — helicopters

- (a) The pilot-in-command may operate an aircraft over congested areas provided that:
 - (1) the helicopter is certified in category A or B; and
 - (2) safety measures are established to prevent undue hazard to persons or property on the ground
- (b) The pilot-in-command shall have:
 - (1) established operational procedures to minimise the consequences of an engine failure; and
 - (2) briefed all crew members and task specialists on board on the procedures to be carried out in the event of a forced landing.
- (c) The pilot-in-command shall ensure that the mass at take-off, landing or hover shall not exceed the maximum mass specified for:
 - (1) a hover out of ground effect (HOGE) with all engines operating at the appropriate power rating; or
 - (2) if conditions prevail that a HOGE is not likely to be established, the helicopter mass shall not exceed the maximum mass specified for a hover in ground effect (HIGE) with all engines operating at the appropriate power rating, provided prevailing conditions allow a hover in ground effect at the maximum specified mass.

SECTION 2 Helicopter external sling load operations (HESLO)

NCO.SPEC.HESLO.100 Checklist

The checklist for HESLO shall contain:

- (a) normal, abnormal and emergency procedures;
- (b) relevant performance data;
- (c) required equipment;
- (d) any limitations; and
- (e) responsibilities and duties of the pilot-in-command, and, if applicable, crew members and task specialists.

NCO.SPEC.HESLO.105 Specific HESLO equipment

The helicopter shall be equipped with at least:

- (a) one cargo safety mirror or alternative means to see the hook(s)/load; and
- (b) one load meter, unless there is another method of determining the weight of the load.

NCO.SPEC.HESLO.110 Transportation of dangerous goods

The operator transporting dangerous goods to or from unmanned sites or remote locations shall apply to the CAAT for an exemption from the provisions of the Technical Instructions if they intend not to comply with the requirements of those Instructions.

SECTION 3 Human external cargo operations (HEC)

NCO.SPEC.HEC.100 Checklist

The checklist for HEC shall contain:

- (a) normal, abnormal and emergency procedures;
- (b) relevant performance data;
- (c) required equipment;
- (d) any limitations; and
- (e) responsibilities and duties of the pilot-in-command, and, if applicable, crew members and task specialists.

NCO.SPEC.HEC.105 Specific HEC equipment

- (a) The helicopter shall be equipped with:
 - (1) hoist operations equipment or cargo hook;
 - (2) one cargo safety mirror or alternative means to see the hook; and
 - (3) one load meter, unless there is another method of determining the weight of the load.
- (b) The installation of all hoist and cargo hook equipment other than a simple PCDS, and any subsequent modifications shall have an airworthiness approval appropriate to the intended function.

SECTION 4 Parachute operations (PAR)

NCO.SPEC.PAR.100 Checklist

The checklist for PAR shall contain:

- (a) normal, abnormal and emergency procedures;
- (b) relevant performance data;
- (c) required equipment;
- (d) any limitations; and
- (e) responsibilities and duties of the pilot-in-command, and, if applicable, crew members and task specialists.

NCO.SPEC.PAR.105 Carriage of crew members and task specialists

The requirement laid down in NCO.SPEC.120(c) shall not be applicable for task specialists performing parachute jumping.

NCO.SPEC.PAR.110 Seats

Notwithstanding NCO.IDE.A.140(a)(1) and NCO.IDE.H.140(a)(1), the floor of the aircraft may be used as a seat, provided means are available for the task specialist to hold or strap on.

NCO.SPEC.PAR.115 Supplemental oxygen

Notwithstanding NCO.SPEC.110(f), the requirement to use supplemental oxygen shall not be applicable for crew members other than the pilot-in-command and for task specialists carrying out duties essential to the specialised task, whenever the cabin altitude:

- (a) exceeds 13 000 ft, for a period of not more than 6 minutes; or
- (b) exceeds 15 000 ft, for a period of not more 3 minutes.

NCO.SPEC.PAR.120 Release of dangerous goods

Notwithstanding point NCO.SPEC.160, parachutists may carry smoke trail devices and exit the aircraft for the purpose of parachute display over congested areas of cities, towns or settlements or over an open-air assembly of persons, provided those devices are manufactured for that purpose.

SECTION 5 Aerobatic flights (ABF)

NCO.SPEC.ABF.100 Checklist

The checklist for ABF shall contain:

- (a) normal, abnormal and emergency procedures;
- (b) relevant performance data;
- (c) required equipment;
- (d) any limitations; and
- (e) responsibilities and duties of the pilot-in-command, and, if applicable, crew members and task specialists.

NCO.SPEC.ABF.105 Documents and information

The following documents and information listed in NCO.GEN.135(a) need not be carried during aerobatic flights:

- (a) details of the filed ATS flight plan, if applicable;
- (b) current and suitable aeronautical charts for the route/area of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted; and
- (c) procedures and visual signals information for use by intercepting and intercepted aircraft.

NCO.SPEC.ABF.110 Equipment

The following equipment requirements need not be applicable to aerobatic flights:

- (a) first-aids kit as laid down in NCO.IDE.A.145 and NCO.IDE.H.145;
- (b) hand-fire extinguishers as laid down in NCO.IDE.A.160 and NCO.IDE.H.180; and
- (c) emergency locator transmitters or personal locator beacons as laid down in NCO.IDE.A.170 and NCO.IDE.H.170.

SECTION 6 Maintenance check flights (MCFs)

NCO.SPEC.MCF.100 Levels of maintenance check flights

Before conducting a maintenance check flight, the operator shall determine the applicable level of the maintenance check flight as follows:

- (a) a “Level A” maintenance check flight for a flight where the use of abnormal or emergency procedures, as defined in the aircraft flight manual, is expected, or where a flight is required to prove the functioning of a backup system or other safety devices;
- (b) a “Level B” maintenance check flight for any maintenance check flight other than a “Level A” maintenance check flight.

NCO.SPEC.MCF.105 Operational limitations

- (a) By way of derogation from point NCO.GEN.105(a)(4) of this Part NCO, a maintenance check flight may be conducted with an aircraft that has been released to service with incomplete maintenance as specified in applicable requirement for continuing airworthiness.
- (b) By way of derogation from point NCO.IDE.A.105 or NCO.IDE.H.105, the pilot-in-command may conduct a flight with inoperative or missing items of equipment or functions required for the flight if those inoperative or missing items of equipment or functions have been identified in the checklist referred to in point NCO.SPEC.MCF.110.

NCO.SPEC.MCF.110 Checklist and safety briefing

- (a) The checklist referred to in point NCO.SPEC.105 shall be updated as needed before each maintenance check flight and shall consider the operating procedures that are planned to be followed during the particular maintenance check flight.
- (b) Notwithstanding point NCO.SPEC.125(b), a safety briefing of the task specialist shall be required before each maintenance check flight.

NCO.SPEC.MCF.120 Flight crew requirements

When selecting a flight crew member for a maintenance check flight, the operator shall consider the aircraft complexity and the level of the maintenance check flight as defined in point NCO.SPEC.MCF.100.

NCO.SPEC.MCF.125 Crew composition and persons on board

- (a) The pilot-in-command shall identify the need for additional crew members or task specialists, or both, before each intended maintenance check flight, taking into consideration the expected flight crew member or task specialist workload and the risk assessment.
- (b) The pilot-in-command shall not allow persons on board other than those required under point (a) during a “Level A” maintenance check flight.

NCO.SPEC.MCF.130 Simulated abnormal or emergency procedures in flight

By way of derogation from point NCO.SPEC.145, a pilot-in-command may simulate situations that require the application of abnormal or emergency procedures with a task specialist on board if the simulation is required to meet the intention of the flight and if it has been identified in the check list referred to in point NCO.SPEC.MCF.110 or in operating procedures.

NCO.SPEC.MCF.140 Systems and equipment

When a maintenance check flight is intended to check the proper functioning of a system or equipment, that system or equipment shall be identified as potentially unreliable, and appropriate mitigation measures shall be agreed prior to the flight in order to minimise risks to flight safety.

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