CS-MMEL ISSUE 2 — CHANGE INFORMATION

EASA publishes amendments to certification specifications and acceptable means of compliance and guidance material as consolidated documents. These documents are used for establishing the certification basis for applications made after the date of entry into force of the applicable amendment.

Consequently, except for a note '[Issue No: MMEL/2]' under the amended paragraph, the consolidated text of CS-MMEL does not allow readers to see the detailed changes that have been introduced compared to the previous issue. To allow readers to see these detailed changes, this document has been created. The same format as for the publication of notices of proposed amendments (NPAs) has been used to show the changes:

(a) deleted text is ~~struck through~~;

(b) new or amended text is highlighted in blue;

(c) an ellipsis […] indicates that the rest of the text is unchanged.

CS MMEL.100 Applicability

These Certification Specifications for establishing the MMEL are applicable to complex motor-powered aircraft and to non-complex helicopters that are certified for:

— operation under instrument flight rules (IFR),

— flight into icing conditions, or

— Category A operations. ~~and contains certification specifications for establishing the MMEL.~~

GM2 MMEL.107(a) Status of provided data: OSD box concept

(a) Because of the alleviative nature of the MEL, the fact that the MMEL is mandatory data for the end-user means that the MEL is not less restrictive than the MMEL, ~~as specified under 8.a.3. of Annex IV to Regulation (EC) No 216/2008~~ but it may be more restrictive.

(b) […]

GM5 MMEL.120 Format and content of MMEL

MMEL PREAMBLE

(SPECIMEN)

EUROPEAN UNION AVIATION SAFETY AGENCY

MASTER MINIMUM EQUIPMENT LIST

(AIRCRAFT TYPE)

PREAMBLE

Introduction

The following is applicable for operators subject to ~~under European air operations regulations (~~Commission Regulation (EU) No 965/2012 of 5 October 2012 - Air Operations ~~Regulation Air Operations)~~. Paragraph 1.~~c~~3.2 of Annex II ~~to Article 5~~ (essential requirements for airworthiness) of Regulation ~~(EC) No~~ (EU) 2018/1139 (the 'Basic Regulation') requires that all equipment installed on an aircraft required for type certification or by operating rules shall be operative. However, paragraph 2~~.a.3~~(c)(iii) of Annex V ~~to Article 8~~ (essential requirements for air operations) of the Basic Regulation also allows the use of a Minimum Equipment List (MEL) where compliance with certain equipment requirements is not necessary in the interests of safety under all operating conditions. Experience has shown that with the various levels of redundancy designed into aircraft, operation of every system or installed items may not be necessary when the remaining operative equipment can provide an acceptable level of safety.

Purpose and limitations

This Master Minimum Equipment List (MMEL) is developed by the applicant and holders of the (Supplemental) Type Certificate and approved by the European Union Aviation Safety Agency to improve aircraft use, and thereby, to provide~~ing~~ more convenient and economic air transportation for

the public. This MMEL includes those items related to airworthiness, air operations, airspace requirements and other items that ~~the Agency~~EASA finds may be inoperative, ~~and yet~~ while maintaining an acceptable level of safety ~~by~~ through appropriate conditions and limitations; it does not contain obviously required items such as wings, flaps, and rudders. In order to maintain an acceptable level of safety, the MMEL establishes limitations on the duration of, and conditions for, operation with inoperative items. Unless specifically allowed by this MMEL, an inoperative item may not be removed from the aircraft.

This MMEL includes items identified by a '#'-symbol or provided in a dedicated list, which have been based only on European operational requirements, using associated guidance developed by ~~the Agency~~EASA.~~These items could be adapted to the applicable operational requirements when these differ from the European operational requirements, if permitted by the State of the Operator, for the approval of the MEL~~. If the applicable operational requirements differ from the European operational requirements, then for the approval of the MEL, the items in the MMEL could be adapted to the applicable operational requirements, provided that is permitted by the State of the operator.

In ~~this~~ such a case, the MEL content is still considered to be in conformity with the content of this MMEL.

[…]

DEFINITIONS AND EXPLANATORY NOTES

[…]

Dash '#' in column 2 (Rectification Interval), or its equivalent in an MMEL, means that the rectification interval is not specified at the level of that item, but rather that it is specified in another MMEL item that is referred to as part of the dispatch conditions (e.g. item B is considered to be inoperative).

[…]

'**Day**' or **'Daylight'** means the period between the beginning of morning civil twilight and the end of evening civil twilight relevant to the local aeronautical airspace; or such other period, as may be prescribed by the appropriate authority.

[…]

'Extended overwater flight' means a flight where the aeroplane is operated over water at a distance, away from land suitable for making an emergency landing, that is greater than:

(1) the distance covered in 120 minutes at cruising speed, or 400 NM, whichever is the lesser, in the case of aeroplanes that are capable of continuing the flight to an aerodrome with the critical engine(s) becoming inoperative at any point along the route, or with planned diversions; or

(2) for all other aeroplanes, the distance covered in 30 minutes at cruising speed, or 100 NM, whichever is the lesser.

[…]

'**Flight**', for the purposes of this MMEL, means:

— for aeroplanes: the period of time between the moment when an aircraft begins to move under its own power, for the purpose of preparing for take-off, until the moment the aircraft comes to a complete stop on its parking area, after the first landing.

— for helicopters: the period of time between the moment when the rotor of the helicopter starts to turn for the purpose of taking off, until the moment when the rotor is stopped after the helicopter finally comes to rest at the end of the flight.

[…]

'Minimum Equipment List' means a document established as ~~specified under~~per paragraph 5(c) ~~8.a.3~~. of ~~Annex~~Article 30~~IV to~~ of Regulation ~~(EC) No~~ (EU) 2018/1139 ~~216/2008~~ and approved by the competent authority, in accordance with ORO.MLR.105 of Annex III (Part-ORO) to Regulation (EU) No 965/2012, that authorises an operator to dispatch an aircraft with aircraft equipment inoperative as per CAT.IDE.A/H.105 of Annex I (Part-CAT) to Regulation (EU) No 965/2012 or NCC.IDE.A/H.105 of Annex VI (Part-NCC) to Regulation (EU) No 965/2012 under the conditions specified therein.

[…]

'**Operative'** means that the system and/or component can accomplish its intended purpose and consistently functions normally within its design operating limit(s) and tolerance(s). When an MMEL item specifies that an item of equipment must be operative, it does not mean that its operational status must be verified; the item is to be considered to be operative unless it is reported or known to be malfunctioning. When an MMEL item specifies that an item of equipment must be verified as being operative, it means that it must be checked and confirmed as being operative at the interval(s) specified for that MMEL item. When an MMEL item specifies that an item of equipment must be verified, but no interval is specified, verification is only required at the time of deferral.

[…]

Triple Asterisk '* '** means an item which is not required by the regulations, but which may have been installed on some models of aircraft that are covered by this MMEL. This item may be included on the aircraft operator's MEL after it has been determined that the item has been installed on one or more of the aircraft operator's aircraft. The triple asterisk symbol, however, must not be carried forward into the aircraft operator's MEL. It should be noted that the use of this symbol does not provide the authority to install or remove an item from an aircraft.

GM4 MMEL.130 Rectification Interval

If a time period is specified in flight hours for an item whose rectification interval category is A, the flight hours that are counted as part of that period should start at the commencement of taxiing prior to the first flight for aeroplanes and at the start of the rotation of the rotor for helicopters under the associated MEL item.

CS MMEL.145 Justification of MMEL items

(a) The justifications are provided by the applicant along with each MMEL item.

(b) The inclusion of each item in the MMEL is justified following one or more methods, also referred to as MMEL safety methodologies, as agreed with ~~the Agency~~ EASA.

[…]

(f) Where a detailed quantitative analysis is required, notwithstanding paragraph (d), a qualitative analysis may only be used for conventional and simple systems when the aircraft is certified against requirements other than CS 25/29.1309.

APPENDIX 1 TO GM1 MMEL.145: MMEL ITEMS GUIDANCE BOOK

[…]

ATA 23 COMMUNICATIONS

Summary of the guidance items:

Item	ATA
Headset (MC)	23-10-1
Audio Selector Panel	23-10-2
Flight Crew Compartment Speaker	23-10-3
HF Communications	23-11-1
VHF Communications	23-12-1
Audio Selector Panel Frequency Controls and Indications	23-13-1
~~Datalink (MC)~~	~~23-20-1~~
Public Address System	23-30-1
Datalink	23-30-2
Flight Crew Interphone System (Flight Crew Compartment Intercommunication) (MC)	23-40-1
Crew Member Interphone System (MC)	23-40-2
Flight Crew Compartment Door Surveillance System (MC)	23-70-1
Cockpit Voice Recorder (MC)	23-71-1

[…]

Aircraft applicability: Aeroplanes ~~& Helicopters~~

ATA Chapter: 23 Communications				
(1) System & Sequence Numbers	(2) Rectification Interval			
ITEM		(3) Number installed		
			(4) Number required for dispatch	
				(5) Remarks or Exceptions
23-70-1 Flight Crew Compartment Door Surveillance System (e.g. CCTV) (MC)				
23-70-1A	D	-	0	(O) May be inoperative provided that alternate procedures are established and used.

Additional considerations:

~~N/A~~ ORO.SEC.100.A of Annex III (Part-ORO) to Regulation (EU) No 965/2012 states that for flight crew compartment security reasons, a means should be provided to monitor, from either pilot's station, the area outside the flight crew compartment to the extent necessary to identify any persons who request entry to the flight crew compartment, and to detect any suspicious behaviour or potential threat.

The installation of a CCTV system enables compliance with the above regulation so that the pilot can monitor the area while seated at his or her station.

Means such as a spyhole, in combination with procedures that are based on the minimum number of flight crew members who have to be present in the compartment, may be used as an acceptable alternate method.

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 23 Communications				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
23-71-1 Cockpit Voice Recorder System (MC)				
23-71-1A	D	-	-	Any in excess of those required by regulations may be inoperative.
23-71-1B	A	-	0	May be inoperative provided that: (a) The aircraft does not exceed 8 further consecutive flights with the cockpit voice recorder inoperative, (b) Less than a ~~A~~ maximum of 72 hours have elapsed since the cockpit voice recorder was found to be inoperative, and (c) Any Flight Data Recorder required to be carried is operative. Note 1: This alleviation is not applicable to Flight data and cockpit voice combination recorders. For those combined systems, see the entries for combination recorders in item 31-31-2. Note 2: If an Underwater Locating Device (ULD) is required by regulation to be fitted to the CVR and this ULD is inoperative, the associated CVR is considered to be inoperative. If an Emergency Locator Transmitter (ELT) is required by regulation to be fitted to the CVR and this ELT is inoperative, the associated CVR is considered to be inoperative.

Additional considerations:

N/A

[…]

ATA 25 EQUIPMENT/FURNISHINGS

ED Decision 20XX/XXX/R

Summary of the guidance items:

ITEM	ATA
Flight Crew Seats (MC)	25-11-1
Observer Seats (MC)	25-11-2
Passenger Seats (MC)	25-21-1
Cabin Crew Seat Assembly (single or dual position)	25-21-2
Exterior Lavatory Door Ashtrays (MC)	25-40-1
Interior Lavatory Ashtrays (MC)	25-40-2
Escape Slides	25-60-1
Independent portable lights (MC)	25-60-2
Protective Breathing Equipment (PBE) (MC)	25-60-3
Megaphones (MC)	25-60-4
Life rafts (MC)	25-60-5
Survival Equipment (MC)	25-60-6
Emergency Flotation Equipment	25-60-7
Crash Axes and Crowbars (MC)	25-61-1
First-Aid Kits (MC)	25-62-1
Emergency Medical Kits (MC)	25-62-2
Emergency Locator Transmitter (MC)	25-63
Life jackets (MC)	25-64-1
Low-Frequency Underwater Locating Device (ULD)(MC)	25-65-1

(…)

Aircraft applicability: Aeroplanes

ATA Chapter: 25 Equipment/Furnishings	
(1) System & Sequence Numbers	(2) Rectification Interval

ITEM			(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
25-65-1	**Low-Frequency Underwater Locating Device (ULD) (MC)**				
25-65-1A		D	-	-	Any in excess of those required by regulations may be inoperative or missing.
25-65-1B		C	-	0	May be inoperative or missing.

Additional considerations:

When aeroplanes conduct extended overwater operations, they are required, under the conditions given by CAT.IDE.A.285 of Annex IV (Part-CAT) to Regulation (EU) No 965/2012, to be fitted with a securely attached ULD that operates at a frequency of 8.8 kHz ± 1 kHz.

ATA 30 ICE PROTECTION

[…]

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 30 Ice and Rain Protection					
(1) System & Sequence Numbers ITEM		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
30-80-2	**Ice Detection System**				
30-80-~~1~~2A	System certified as an Advisory System	D	-	0	May be inoperative provided that procedures do not require its use.
30-80-~~1~~2B	System certified as a Primary Detection System	C	-	0	(O) May be inoperative provided that alternate procedures are established and used. Procedures: (O) To provide a procedure to the crew to determine the conditions ~~where~~ in which the ice protection system must be activated manually.

[…]

ATA 31 INDICATING/RECORDING SYSTEMS

[…]

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 31 Indicating/Recording Systems				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
31-31-1 Flight Data Recorder (FDR) (MC)				
31-31-1A	D	-	-	Any in excess of those required by regulations may be inoperative provided that the FDR parameters are not required for monitoring purpose.
31-31-1B	A	-	0	May be inoperative provided that: (a) The aircraft does not exceed 8 further consecutive flights with the FDR inoperative, and (b) Less than a ~~A~~ maximum of 72 hours have elapsed since the FDR was found to be inoperative, and (c) Any Cockpit Voice Recorder required to be carried is operative. Note 1: This alleviation is not applicable to flight data and cockpit voice combination recorders. For those combined systems, see the entries for flight data and cockpit voice combination recorders in item 31-31-3. Note 2: The flight data recorder is considered to be inoperative when any of the following conditions exist: (i) Loss of the flight recording function is evident to the flight crew during the pre-flight check, e.g. by means of a system status monitor; or (ii) The need for maintenance has been identified by the system monitors, where available, and the failure origin has not been identified; or (iii) Analyses of recorded data or maintenance actions have shown that more than 5 % of the total number of individual parameters (variable and discrete) required to be recorded for the particular aircraft, are not being recorded properly (refer to 31-31-1C).
(continued)				

ATA Chapter: 31 Indicating/Recording Systems				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
(continued)				Note 3: Where improper recording affects 5 % of the required parameters or less, refer to item 31-31-4. Note 4: If an Underwater Locating Device (ULD) is required by regulation to be fitted to the FDR and this ULD is inoperative, the associated FDR is considered to be inoperative. If an Emergency Locator Transmitter (ELT) is required by regulation to be fitted to the FDR and this ELT is inoperative, the associated FDR is considered to be inoperative.
31-31-1~~2A~~C	A	-	0	Up to 5 % of the required parameters may be inoperative for a maximum of 90 calendar days or until the next maintenance inspection, whichever occurs first.

Additional considerations:

Cockpit voice recorders ~~is~~ are covered under item 23-71-1.

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 31 Indicating/Recording Systems				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
31-31-2 Flight Data and Cockpit Voice Combination Recorder (MC)				
31-31-2A	D	-	-	(O) (M) Any function may be inoperative provided: (a) The affected function is not required, and (b) The affected data is not required for monitoring purposes.
31-31-2B	A	1	0	The ~~F~~flight data recorder and/or the cockpit voice recorder function may be inoperative provided that: (a) The other function, where required, is operative, (b) The aircraft does not exceed 8 further consecutive flights with the inoperative function, and (c) Less than a ~~A~~ maximum of 72 hours have elapsed since the ~~inoperative~~ function was found to be inoperative. Note 1: A flight data and cockpit voice combination recorder is a single flight recorder that combines the functions of a flight data recorder and of a cockpit voice recorder.
(continued)				

ATA Chapter: 31 Indicating/Recording Systems				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
(continued)				Note 2: The flight data recorder is considered to be inoperative when any of the following conditions exist: (i) The ~~L~~loss of the flight recording function is evident to the flight crew during the pre-flight check, e.g. by means of a system status monitor; or (ii) The need for maintenance has been identified by the system monitors, where available, and the failure origin has not been identified; or (iii) Analyses of recorded data or maintenance actions have shown that more than 5 % of the total number of individual parameters (variable and discrete) required to be recorded for the particular aircraft are not being recorded properly. Note 3: Where improper recording affects 5 % of the required parameters or less, refer to item 31-31-4. Note 4: If an Underwater Locating Device (ULD) is required by regulation to be fitted to the flight data and cockpit voice combination recorder and this ULD is inoperative, the associated flight data and cockpit voice combination recorder is considered to be inoperative. If an Emergency Locator Transmitter (ELT) is required by regulation to be fitted to the flight data and cockpit voice combination recorder and this ELT is inoperative, the associated flight data and cockpit voice combination recorder is considered to be inoperative.
31-31-2C	A	2	1	One of the two required flight data and cockpit voice combination recorders may be inoperative for a maximum of 10 calendar days.

				Note: If an Underwater Locating Device (ULD) is required by regulation to be fitted to the flight data and cockpit voice combination recorder and this ULD is inoperative, the associated flight data and cockpit voice combination recorder is considered to be inoperative. If an Emergency Locator Transmitter (ELT) is required by regulation to be fitted to the flight data and cockpit voice combination recorder and this ELT is inoperative, the associated flight data and cockpit voice combination recorder is considered to be inoperative.

Additional considerations:

Cockpit voice recorders ~~is~~ are covered under item 23-71-1.

ATA 33 LIGHTS

[…]

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 33 Lights				
(1) System & Sequence Numbers Item		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
33-42-1	**Anti-Collision Light System**				Note: This guidance may be subject to additional restrictions in accordance with the applicable Rules of the Air.
33-42-1-1	Fuselage Lights (Beacon or Strobe Type)				Note: If the fuselage anti-collision light is inoperative, alternate procedures are established and used when the aircraft is on the ground with engine(s) running.

33-42-1-1A	(Aeroplanes)	C	-	1	(O) Either the upper or the lower fuselage lights may be inoperative provided an acceptable number of white wing-tip strobe lights are operative. **Procedures:** (O) to provide guidance to the crew for operations of anti-collision and strobe lights.
33-42-1-1B	(Aeroplanes)	C	-	0	(O) May be inoperative for daylight operations provided all white wing-tip strobe lights are operative. **Procedures:** (O) To provide guidance to the crew for operations of anti-collision and strobe lights.
33-42-1-1C	(Helicopters)	C	-	1	Any in excess of one may be inoperative.
33-42-1-1D	(Helicopters)	A	-	0	(O) One or more may be inoperative for a single night flight when departing from an offshore or remote installation provided: (a) The appropriate Air Navigation Service Provider (ANSP) has been informed before departure, (b) The navigation light system is operative, and (c) The landing light system is operative. **Procedures:** (O) To provide guidance to the crew for operations of remaining lights.
33-42-1-1E	(Helicopters and other than Commercial Air Transport operations of aeroplanes)	B	-	0	May be inoperative for daylight operations.
33-42-1-2	Wing-Tip/Tail Strobe Lights (if installed)				
33-4~~1~~2-1-2A		C	-	0	One or more of these may be inoperative.

[…]

Aircraft applicability: <u>Aeroplanes</u>

ATA Chapter: 33 Lights					
(1) System & Sequence Numbers		(2) Rectification Interval			
ITEM			(3) Number installed		
				(4) Number required for dispatch	
					(5) Remarks or Exceptions
33-50-1	Cabin Emergency Lighting				

33-50-1-1	Overhead Emergency Lighting (each aisle)				
33-50-1-1A		B	-	-	A maximum of one in four consecutive overhead emergency lights (or light assemblies) may be inoperative. Note: For aeroplanes which have two rows of lights per aisle (i.e. mounted on the overhead bins), then the above alleviation is acceptable for each row of lights but the inoperative lights must not be directly opposite each other.
33-50-1-2	EXIT Marking Signs				
33-50-1-2A		C	-	-	Up to 50 % of the bulbs/LEDs may be inoperative in one or more signs provided the sign remains legible.
33-50-1-2B		-	-	-	One may be inoperative provided the associated door/exit is considered inoperative. Refer to item 52-22. Note: If any twin overwing exits are served by a single sign, both exits should be considered inoperative.
33-50-1-3	EXIT Locator Signs				
33-50-1-3A		C	-	-	Up to 50 % of the bulbs/LEDs may be inoperative in one or more signs provided the sign remains legible.
33-50-1-~~3~~4	Exit Area Lighting				
33-50-1-~~3~~4A		-	-	-	May be inoperative provided that the associated door/exit is considered to be inoperative. Refer to item 52-22.
(continued)					

ATA Chapter: 33 Lights					
(1) System & Sequence Numbers		(2) Rectification Interval			
ITEM			(3) Number installed		
				(4) Number required for dispatch	
					(5) Remarks or Exceptions
(continued)					
33-50-1-~~4~~5	Floor Proximity Lighting (Electrical or photo luminescent systems)				
33-50-1-~~4~~5-1	Individual Lights/ strips				
33-50-1-~~4~~5-1A		B	-	-	Lights/strips may be inoperative provided that:

					(a) All lights/strips marking right-angled intersections, including cross aisles and overwing exits, are operative, (b) Along each aisle axis, all lights/strips within one metere of lights/strips marking right-angled intersections are operative, and (c) A minimum of lights/strips evenly distributed along each aisle axis to provide the required escape guidance are operative.
33-50-1-45-2	EXIT Markers/Identifiers				
33-50-1-45-2A		C	-	-	Up to 50 % of the bulbs/LEDs may be inoperative in one or more signs provided that the sign remains legible.
33-50-1-45-2B		-	-	-	One item may be inoperative provided that the associated door/exit is considered to be inoperative. Refer to item 52-22.

[…]

Additional considerations:

34-20-2F:

Prior to allowing dispatch without any attitude indication, a review of the certification requirements as well as the handling qualities and training of the flight crew is required.

34-20-3A & B Standby attitude indication:

If the standby attitude indicator is needed to meet the applicable requirements (e.g. CS-23.2500~~1311~~ Electronic Flight Display or CS-25.1309), relief may not be granted for operations under IFR ~~f~~or at night ~~VFR or IFR operations~~. Case-by-case evaluations are, however, possible, based on the applicable CS-MMEL requirements. The VMC with a visual horizon limitation prohibits 'VFR on top' or 'VFR over-the-top' operations.

[…]

ATA 34 NAVIGATION — Navigation equipment

Summary of the guidance items:

ITEM	ATA
Marker Beacon (MC)	34-31-1
ILS (or MLS) (MC)	34-32-1
Airborne Collision Avoidance System (ACAS) (MC)	34-40-1
Area Navigation System	34-40-2
Weather Detection System (Antenna(s), XCVR(s), Controller(s), Display(s))	34-41-1
Wind shear Detection/Warning System (if installed)	34-41-2

Navigation Systems (based on VOR, DME, ADF, GNSS, INS)	34-51-1
Terrain Awareness Warning System (TAWS)	34-43-1
SSR Transponder Mode A/C	34-54-1
SSR Transponder Mode S	34-54-2
Aircraft Tracking Equipment	34-55-1

[...]

Aircraft applicability: Aeroplanes

ATA Chapter: 34 Navigation				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
34-32-1 ILS (or MLS) (MC)				
34-32-~~2~~1A	B	-	0	May be inoperative under IFR operations provided that any approaches ~~and~~ or missed approaches ~~where~~ in which navigation is based on ILS are not included in the flight plan.
34-32-~~2~~1B	D	-	0	May be inoperative under VFR operations.

(...)

ATA Chapter: 34 Navigation				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
(continued)				
34-54-2-1 Enhanced Surveillance Functions				
34-54-2-1A	D	-	0	One or more Downlinked Aircraft Parameters (DAPs), which provide Enhanced Surveillance, may be inoperative when not required for the intended flight route.
34-54-2-1B	C	-	0	One or more Downlinked Aircraft Parameters (DAPs), which provide Enhanced Surveillance, may be inoperative when required for the intended flight route.

ATA Chapter: 34 Navigation					
(1) System & Sequence Numbers ITEM		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
(continued)					Note 1: Enhanced surveillance capability is required in Mode S EHS notified airspace. Note 2: For operations in the Single European Sky, enhanced surveillance capability cannot remain inoperative more than 3 consecutive days.
34-54-2-2	Extended Squitter (ADS-B OUT) Transmissions				
34-54-2-2A		D	-	0	One or more extended squitter transmissions may be inoperative when not required for the intended flight route.
34-54-2-2B		C	-	0	One or more extended squitter transmissions may be inoperative when required for the intended flight route. Note: For operations in the Single European Sky, enhanced surveillance capability cannot remain inoperative more than 3 consecutive days.

(…)

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 34 Navigation					
(1) System & Sequence Numbers ITEM		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
34-55-1	**Aircraft Tracking Equipment**				
34-55-1A		D	-	-	Any in excess of those required by regulations may be inoperative.
34-55-1B		C	-	-	May be inoperative provided that at least one automatic emergency locator transmitter is operative.

Additional considerations:

An aircraft tracking system is required for helicopter offshore operations in a hostile environment, according to SPA.HOFO.150 of Annex V (Part-SPA) to Regulation (EU) No 965/2012, and for aeroplanes under the conditions given by CAT.GEN.MPA.205 (a) of Annex IV (Part-CAT) to Regulation (EU) No 965/2012.

[…]

ATA 46 INFORMATION SYSTEMS

Summary of the guidance items:

Item	ATA
Electronic Flight Bag (EFB) Systems	46-20-1
~~Class 2~~ EFB Installed Resources	46-20-2
Power Connection for ~~Class 1 and Class 2~~ Portable EFB	46-20-3

Aircraft applicability: Aeroplanes & helicopters

ATA Chapter: 46 Information Systems					
(1) System & Sequence Numbers ITEM		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
46-20-1	**Electronic Flight Bag (EFB) Systems**				
46-20-1A		C	-	0	(O) May be inoperative provided that alternate procedures are established and used where operating procedures require the use of the affected EFB.
46-20-1B		C	-	1	(O) Any in excess of one may be inoperative provided that alternate procedures are established and are used to ensure that the required back-up means are available to the crew.
46-20-1C		D	-	0	May be inoperative provided that procedures do not require the use of the affected EFB.
46-20-2	~~Class 2~~ EFB Installed resources				
46-20-2-1	Mounting Device				
46-20-2-1A		C	-	1	(M) (O) Any in excess of one may be inoperative provided the affected EFB is secured by an alternative means.
46-20-2-1B		C	-	0	(M) (O) May be inoperative provided that: (a) The associated EFB is used in accordance with ~~Class 1~~ the portable EFB stowage criteria, and (b) Alternate procedures are established and used where operating procedures require the use of the affected EFB.

46-20-2-1C	D	-	0	(M) May be inoperative provided that: (a) The associated EFB and hardware are properly stored or removed from the aircraft, and (b) The associated EFB is considered inoperative (Refer to 46-20-1C).
46-20-2-2 Data Connectivity				
46-20-2-2A	C	-	1	(M) (O) Any in excess of one may be inoperative provided that an alternative means of data connectivity is used.
46-20-2-2B	C	-	0	(M) (O) May be inoperative provided that alternate procedures are established and used where operating procedures require the use of the affected EFB.
46-20-2-2C	D	-	0	May be inoperative provided that procedures do not require the use of the affected data connectivity. **Procedures:** (M) To give guidance reference for deactivation of the affected item, as appropriate, and to establish alternate means, as applicable. (O) To provide instructions to the flight crew for alternate procedures to be used.
(continued)				

ATA Chapter: 46 Information Systems				
(1) System & Sequence Numbers ITEM	(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
(continued)				
46-20-3 Power Connection for ~~Class 1 and Class 2~~ Portable EFB				
46-20-3A	C	-	1	(M) (O) Any in excess of one may be inoperative provided that an alternative power source is available and can be used for the planned duration of use of the affected EFB.
46-20-3B	C	-	0	(M) (O) May be inoperative provided that alternate procedures are established and used.
46-20-3C	D	-	-	May be inoperative provided that procedures do not require the use of the affected power connection. **Procedures**: (M) To give guidance reference for deactivation of the affected item, as appropriate, and to establish alternate means, as applicable. (O) To provide instructions to the flight crew for alternate procedures to be used.

Additional considerations:

The purpose of entry 46-20-1 is not to require the inclusion of ~~Class 1 & 2~~ portable EFBs in an operator's MEL, but it is a means of controlling any inoperative EFB equipment. Other means may also be agreed with the competent authority.
Any EFB function which operates normally may be used.

[…]

ATA 52 DOORS

[…]

Additional considerations:

52-11-1 Door/exit

[…]

Condition (f): ~~In case of~~ If cabin crew seats are located adjacent to an inoperative pair of exits, the operator should consider~~ed a re-location of one or more cabin crew to a different zone of the cabin in order to improve~~ the best location for the affected cabin crew members, taking into account the updated emergency evacuation procedures. A re-location of cabin crew members can be envisaged, provided that sufficient cabin crew members remain at the pair of inoperative exits to orientate the passengers towards the best available exits during an evacuation

GM3 MMEL.145 Justification of MMEL items

ELECTRONIC ENGINE CONTROL SYSTEM (EECS) FAILURES — ENGINE TIME-LIMITED DISPATCH (TLD)

~~(a) In case of a turbine engine, if approval is sought for dispatch with Faults present in an Electronic Engine Control System, Compliance with CS-E.1030 (Time Limited Dispatch (TLD)) should be demonstrated.~~

~~(b) These items should be allocated an 'A' category rectification interval in order to prohibit rectification interval extension.~~

1. Dispatch with engine faults covered by a TLD report

(a) If a dispatch is sought with faults (or a combination of faults) that are present in an electronic engine control system (EECS), a time-limited dispatch (TLD) approval is required, as per Ref. [1] CS-E 1030, for faults such as EECS degraded protection or a loss of redundancy against a loss of thrust control (LOTC)/loss of power control (LOPC).

(b) A TLD approval is granted once the engine manufacturer has demonstrated compliance with the applicable engine certification requirements, including the verification that the LOTC/LOPC rates and hazardous engine effect rates remain acceptable with the proposed rectification time limits.

(c) Engine system faults that do not have an impact on the LOTC rate, or on the compliance with the applicable engine certification requirements, may nevertheless be included as part of the TLD report. These faults are normally indicated as not being derived from the LOTC analysis in the TLD report. In line with FAA Policy No. ANE-1993-33.28TLD-R1, a complete loss of a critical resource or a critical function should be a 'No Dispatch'

configuration in the TLD report. A resource or a function should be considered critical if it is necessary to comply with CS-E 1030(b) and/or (c).

(d) When taking credit for the TLD analysis to demonstrate compliance with CS-MMEL, the aircraft manufacturer should ensure that the MMEL content remains consistent with the TLD restrictions, time limitations, and other related installation requirements set by the engine manufacturer.

2. Evaluation of aircraft-level consequences for MMEL evaluation

(a) When engine-related MMEL items are involved in aircraft level failure conditions that are classified as hazardous or catastrophic, compliance with the applicable requirements for qualitative and quantitative analysis should be demonstrated, as for any candidate MMEL item. Contributions from the engine control system to the aircraft functional hazard assessment (FHA)/system safety assessment (SSA) may be affected, and may need to be re-evaluated. In such cases, coordination between the aircraft and the engine manufacturers is necessary to complete the demonstration of compliance of the MMEL.

(b) It is recommended that the aircraft manufacturer's MMEL safety analysis should be made prior to the definition of the generic cockpit messages related to the TLD categories (short-term and long-term) in order to avoid re-design issues.

3. Dispatch with EECS faults with performance effects

(a) Particular attention should be paid to range-sensitive operations, including LROPS and ETOPS, when engine system faults, including some that are included in the TLD analysis, could have an effect on the fuel consumption, and hence on the range, of the aircraft.

(b) Normally, degraded performance is not analysed by the engine manufacturer for LOTC, but it should be assessed by the aircraft manufacturer.

(c) Flight duration and thrust variation in the event of an in-flight shut down (IFSD) should be considered in the performance /range assessment. If necessary, operational limitations should be specified in the MMEL for authorised combinations of MMEL items.

4. Allocation of MMEL rectification intervals

(a) When a TLD approval is granted at the engine level, the repair limitations for short-term or long-term faults may be used by the aircraft manufacturer to support the allocation of the appropriate MMEL rectification interval.

(b) If the repair intervals are taken from the TLD analysis, the corresponding MMEL items should be allocated an 'A' category rectification interval (with no extension possible).

GM4 MMEL.145(c) Justification of MMEL items

QUALITATIVE SAFETY ASSESSMENT – ITEMS INVOLVED IN NON-NORMAL AND EMERGENCY PROCEDURES

(a) When the item is necessary for the crew to perform an existing non-normal or emergency procedure, the consequences of its unavailability should be evaluated, taking into account the potential worsening of the severity of the in-flight failure condition.

(b) Items which are powered by an emergency bus or equivalent and required to accomplish an emergency procedure are normally not allowed.

(c) Relief may be granted for items that are powered by an emergency bus, provided that the applicant demonstrates by flight test, analysis, or a combination of both, that the MMEL relief

neither affects the successful intended completion and the outcome of the procedure, nor increases the complexity of the procedure for the crew.

(d) Emergency procedures are aircraft-specific, for example, some procedures may direct the pilot to physically turn the emergency power switch to the ON position when a complete electrical failure occurs in flight. One consequence of the selection of the emergency power switch to ON can be that the only communications system available is the number one system, and the only navigational system available is the number one system. That configuration must not allow operations with the number one radio system on the MEL. However, other aircraft may be designed with an electrical system that will automatically select any available electrical power supply during an electrical abnormality. For such a design, it would not be appropriate to limit the radio relief to just the number two radio system, since both radios are able to be powered under any circumstances.

GM5 MMEL.145(c) Justification of MMEL items

QUALITATIVE SAFETY ASSESSMENT — CONSEQUENCES OF THE PROPOSED MMEL DISPATCH CONFIGURATION

(a) Operational consequences of the proposed dispatch configuration (including any limitations and/or procedures) evaluated according to the criteria of CS MMEL.140 (a) and (b), classified as no safety effect or minor as per the associated type-certification basis of the aircraft definitions, are considered to be acceptable.

(b) The classification of failure conditions established in the safety assessment process through the aircraft and system FHAs should be used carefully, as the mitigation means associated with the proposed MMEL item may lead to a reduction in the severity that was identified for type certification purposes.

For example, the failure of one item during a particular flight phase may be considered to be major due to a temporary loss of function until the flight crew performs a manual reconfiguration during the flight. But when this item is known to have failed on the ground, prior to the departure, the consequence may be less critical for the crew, and the application of the associated dispatch conditions can allow the classification to be reduced to an acceptable level.

(c) Conversely, some severities that were set up for the purpose of type certification may need to be complemented or increased. In particular, the effects on the crew workload and potential fatigue need to be carefully assessed. Indeed, the severity of a failure that may have been assessed as having minor effects as an in-flight failure during the type certification may be considered to have more than minor repercussions due to operating for several flights in some operational conditions. Some aggravating factors (e.g. the number of flights of the exposure, the flight duration, flight rules, special operations) will sometimes need to be mitigated by limitations that would normally not apply for a full-up aircraft configuration (e.g. day VFR only, instead of Day & Night VFR, types of operations).

GM1 MMEL.145(d)(2) Justification of MMEL items

METHOD TO DETERMINE MMEL ITEM INVOLVMENT IN HAZ AND CAT FAILURE CONDITION

A fault tree analysis should be used to identify the MMEL items involved in HAZ or CAT failure conditions.

GM1 MMEL.145(f) Justification of MMEL items

QUANTITATIVE ASSESSMENT CRITERIA FOR AIRCRAFT CERTIFIED AGAINST REQUIREMENTS OTHER THAN CS 25/29.1309

For simple and conventional installations (that is, those with low complexity and with similarity in the relevant attributes), it may be possible during the type design certification to assess the probability of a hazardous or catastrophic failure condition as being extremely remote (refer to the TC basis) or extremely improbable (refer to the TC basis), respectively, on the basis of experienced engineering judgement, using only qualitative analysis. The basis for such an assessment will be the degree of redundancy, the established independence and isolation of the channels, and the reliability record of the technology involved. Satisfactory service experience on similar systems commonly used in many aircraft may be sufficient when a close similarity is established regarding both the system design and the operating conditions.

A similar approach may be used for the justification of MMEL items. In particular:

(a) For MMEL items involved in catastrophic failure conditions:

(1) It should be demonstrated that the degree of redundancy under the MMEL dispatch configuration remains adequate to ensure that the involved catastrophic failure condition is still extremely improbable (refer to the applicable type-certification basis definition). This demonstration may be, in some cases, limited to the demonstration that a combination of a minimum of two independent failure(s) or external event(s) is necessary to lead to the catastrophic failure condition. It will take into account that the reliability of the involved systems, based on experienced engineering judgement and service history, would allow the occurrence of the failure condition to continue to meet the qualitative objective used for the type design certification.

(2) No catastrophic failure condition should result from the failure of a single component, part, or element of a system under any MMEL dispatch configuration. The logic and rationale used in the assessment should be straightforward, and should obviously substantiate that the failure mode simply would not occur unless it is associated with an unrelated failure condition that would, in itself, be catastrophic.

(3) The MMEL entry should use standard rectification interval B, or a more restrictive interval, for items that leave the aircraft two independent failure(s) or external event(s) away from a catastrophic failure condition. If there is no reduction in safety margins compared with the full-up configuration, category C may be acceptable.

(b) For MMEL items involved in hazardous failure conditions:

(1) It should be demonstrated that a degree of redundancy under the MMEL dispatch configuration remains available so that a combination of a minimum of two independent failure(s) or external event(s) is necessary to lead to the hazardous failure condition. In such a case, there is no need to demonstrate (even qualitatively) that the failure condition remains extremely remote (refer to the applicable type-certification basis definition) under the MMEL dispatch configuration, as the fact that no single failure or external event exists is sufficient to grant an adequate probability of occurrence under the MMEL dispatch configuration, or

(2) It should be demonstrated, using experienced engineering judgement and service history, that the single failure or external event has a probability of occurrence that is compatible

with the safety objectives used for the type design certification, taking into account the proposed rectification interval.

(3) The MMEL entry should use standard rectification interval B, or a more restrictive interval, for items that leave the aircraft one failure(s) or external event(s) away from a hazardous failure condition. If there is no reduction in safety margins compared with the full-up configuration, category C may be acceptable.