

GM MLE-MMEL/MEL

Toelichting voor *(Master) Minimum Equipment Lists*

Toelaatbare gebreken

GM MAR-MMEL/MEL

Guidance Material for (Master) Minimum Equipment Lists

Permissible unserviceabilities

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INTRODUCTION

This document is Guidance Material. This material is neither mandatory nor regulatory in nature and does not constitute a regulation. It contains statements that are provided as interpretations and explanations only. It also describes acceptable means, but not the only means, for demonstrating compliance with the applicable regulations. The MAA-NLD will consider other methods of demonstrating compliance that an applicant may elect to present. On the other hand, if the MAA-NLD becomes aware of circumstances that convinces her that following this guidance material would not result in compliance with the applicable regulations, the MAA-NLD will not be bound by the terms of this document and may require additional substantiation or design changes as a basis for finding compliance.

GM MAR-MMEL/MEL.010

CALENDAR DAY / FLIGHT DAY

Some A-, and all B-, C- and D-rectification intervals are defined as calendar day or flight day periods. Calendar days and flight days are 24 hour periods from midnight to midnight based on either UTC or local time, as selected by the Operator at the moment he enters a deferred item in the Aircraft Maintenance Record/Logbook. Once the rectification interval has started, the selection may not be changed.

CATASTROPHIC FAILURE CONDITION

Incapacitation of a member of the flightcrew is considered a catastrophic failure condition.

INOPERATIVE (*DEFECT*)

Some equipment has been designed to be fault tolerant and is monitored by computers which transmit fault messages to a centralized computer for the purpose of maintenance. The presence of this category of message does not mean that the equipment is inoperative.

ITEM

- a. In the context of this MAR, a component is considered to be a piece of equipment or instrument.
- b. In the context of this MAR, a system is considered to be a collection of equipments and/or instruments that perform a function. (See EASA AMC 25.1309)

GM MAR-MMEL/MEL.105

ITEMS RELATED TO THE AIRWORTHINESS

Items may in general be identified as related to the airworthiness when their inoperability meets the following criteria:

1. The operation of the aircraft is adversely affected such that instructions in the technical manuals related to ground personnel, flight crew and/or other in-flight personnel, if applicable, are impeded or invalidated
2. The condition does include the use of emergency equipment required by the Military Type Certificate.
3. The condition of the aircraft is adversely affected such that the safety of passengers and/or personnel is jeopardized.

ITEMS REQUIRED BY OPERATIONAL REGULATIONS

These concern items required by either MAR-OPS or local regulations. The MTCH shall evaluate the failure of these items when installed, including the operational and maintenance procedures to safely cope with such conditions. In most cases the MTCH may indicate an X-category Rectification Interval, leave the installed and minimum required number of items undetermined and state 'as required by operational regulations' in the remarks column. The focus for the MTCH shall be to indicate appropriate maintenance procedures, and in some cases operational procedures.

ITEMS REQUIRED BY PROCEDURES STATED IN THE FLIGHT MANUAL

In the Flight Manual certain items may be required for certain kinds of operations. Such items should be included in the MMEL when such items are required for the safe conduct of flight or the safety of the passengers or the personnel for these operations. In addition, such items should be included when

the crew would normally rely upon their serviceability or when their unserviceability would increase in any way the workload of the crew.

Although the items concerned must be listed explicitly in the MMEL, their minimum number required and the conditions for their unserviceability may be included by reference to the Flight Manual.

INCLUSION OF ITEMS IN THE MMEL FOR REASONS OF CLARITY

It may not always be clear whether an item is related to safety or not. Non-safety related items need not be included in the MMEL item list, but for reasons of clarity it may be advised in such case to include the item anyway.

The same holds for safety related items that allow no unserviceability at all. These items need also not be included in the MMEL item list, but for reasons of clarity it may still be advisable in such case to include those items too.

It should be noted that non-safety related items should not be included in the item list for any other reason than for clarity, as explained above.

GM MAR-MMEL/MEL.110

TYPES OF OPERATION

The MMEL should include the dispatch conditions associated with flights for which an Operator would require a Special Approval according to MAR-OPS if such flights are part of the certified use of the aircraft e.g. RVSM, MNPS, PBN, ETOPS, etc.

GM MAR-MMEL/MEL.115.c.3

CHANGES DIRECTED BY THE MAA-NLD

Occasionally, the MAA-NLD may grant an Operator an exemption to operate an aircraft outside the scope or limitations of the MMEL. In such case the MAA-NLD will consider whether a change to the MMEL is appropriate in order to support similar future operations in a more efficient way than through the exemption approval process.

In her determination whether a change to the MMEL is appropriate the MAA-NLD will consult the MTCH and the Operator.

GM MAR-MMEL/MEL.115.f

RECORD OF JUSTIFICATION

The MTCH shall keep a record of justification of each MMEL item, substantiating the minimum required number of items, the rectification interval category, the required operational and maintenance procedures and any additional remarks and dispatch considerations.

Where a MMEL item is based on a 'certification through validation' process, a validation statement and reference to the source document, including amendment status, is sufficient. Note that each MMEL item needs to be validated individually.

Where a MMEL item is based on a 'certification by verification' process, the qualitative and/or quantitative assessments required in accordance with Subpart D of the MLE-MMEL/MEL shall be kept on record.

GM MAR-MMEL/MEL.120

- a. A model of an acceptable Preamble can be found in Appendix 1.
- b. The Preamble must make it clear that not all combinations of inoperative items are considered.
- c. In addition to a Preamble arranged and worded along the lines of this Appendix 1, the MMEL must contain, as part of the preamble, sufficient definitions and explanatory notes to provide the users (these are primarily Operator staff preparing a MEL or MEL-revision) with a full and proper understanding of the intent and purpose of the items it contains.
While many of the definitions used will be common to all MMELs, others will be specific to particular or individual aircraft types. The MTCH shall ensure, when preparing the MMEL, that all relevant definitions are included. Also explanatory notes shall be provided in sufficient detail wherever the intent and purpose of a term or phrase or abbreviation etc. is necessary or advisable.
- d. The MMEL items list should normally be written in a 'five-column format'. Other formats may be accepted provided they are clear and unambiguous. Refer to the example in Appendix 2.
- e. Each item listed in the MMEL should be described and identified in accordance with an appropriate code system acceptable to the MAA-NLD (e.g. ATA 100/2200, WUC, AECMA/ASD S1000D). Consistency of terminology and identification means should be maintained, as far as possible, among aircraft documentation. When items apply to certain aircraft configurations only, this should be identified.
- f. Where a Message Oriented approach is used, the messages displayed may be listed in place of the item title in the relevant section, as this will be considered as a representation of the item(s) affected. Number installed and number required are not needed for such an approach. Refer to the example in Appendix 3.

GM MAR-MMEL/MEL.130

CONCEPT OPERATIONAL AND MAINTENANCE PROCEDURES

Operational and maintenance procedures are part of the MEL. They are an integral part of the compensating conditions needed to maintain an acceptable level of safety, enabling the MAA-NLD to approve the MEL. Although the Operator must determine the exact procedures required for safe operation, tailored to his specific conditions, the MTCH shall at least provide concept procedures with the MMEL to indicate to the Operator the required contents of those procedures and to ensure their general feasibility.

See for further reference GM MAR-MMEL/MEL.230.

GM MAR-MMEL/MEL.135

RECTIFICATION INTERVALS

Refer to GM MAR-MMEL/MEL.235 for a better understanding of the meaning and use of Rectification Intervals.

RECTIFICATION INTERVAL EXTENSION

When rectification cannot be achieved within the time-period specified by the rectification interval, the operator may be allowed, subject to conditions, to extend the time-period for B, C and D Rectification

Intervals by an equal number of days as specified in the original rectification interval. One prerequisite for such extension is that the MTCH has taken such extensions into account in its quantitative safety assessments, if applicable. The MTCH must therefore state in the MMEL whether this is the case or not. (see MAR-MMEL/MEL.310 and GM MAR-MMEL/MEL.310).

GM MAR-MMEL/MEL.205

MEL SHALL BE BASED UPON THE MAA-NLD APPROVED MMEL

The MEL shall be based upon, but no less restrictive than, the MAA-NLD approved MMEL. If the MMEL is customized to the specific aircraft of the Operator, it may be acceptable to copy the technical contents of the MMEL without any further customization. Special attention shall be drawn however to the Preamble and the operational and maintenance procedures to reflect the Operator's own procedures and conditions. In any case the Operator shall issue its own MEL-document and take responsibility to keep it up to date.

ITEMS RELATED TO THE AIRWORTHINESS

Refer to GM MAR-MMEL/MEL.105.

ITEMS REQUIRED BY OPERATIONAL REGULATIONS

These concern items required by either MAR-OPS or local regulations. The Operator shall evaluate the failure of these items when installed, including the operational and maintenance procedures to safely cope with such conditions. When the items concerned are already included in the MMEL he may refer to the maintenance procedures already prepared by the MTCH (ref GM MAR-MMEL/MEL.105). The Operator shall specify the installed and minimum required number of items for his operations, and add any required operational limitations and procedures in the remarks column.

ITEMS REQUIRED BY PROCEDURES STATED IN THE OPERATIONS MANUAL

Refer to GM MAR-MMEL/MEL.105. Replace 'MMEL' by 'MEL' and 'Flight Manual' by 'Operations Manual' to make the text applicable to the MEL. In general, the applicable procedures in the Operations Manual will generate additional restrictions to the MEL.

INCLUSION OF ITEMS IN THE MEL FOR REASONS OF CLARITY

Refer to GM MAR-MMEL/MEL.105. Replace 'MMEL' by 'MEL' to make the text applicable to the MEL. If an Operator elects to provide additional information on non-safety related items, it should do so in separate documents. Such documents may be included in a single binder with the MEL provided these documents are clearly marked according to the provisions of MLE-MMEL/MEL.205.f.2.

COMMENCEMENT OF FLIGHT - FAILURES OCCURRING BEFORE TAKE-OFF

If a taxi phase is applicable before take-off, and a failure occurs during that taxi phase, any decision to continue the flight should be subject to pilot judgement and good airmanship. The commander may refer to the MEL before any decision to continue the flight is taken.

The MEL may include procedures to deal with any failures which occur between the start of taxi and take-off initiation.

GM MAR-MMEL/MEL.210

TYPES OF OPERATION

The MEL should include the dispatch conditions associated with flights conducted in accordance with the Special Approvals list shown on the Military Air Operator's Certificate e.g. RVSM, MNPS, PBN, ETOPS, etc.

GM MAR-MMEL/MEL.215.c.2

CHANGES DIRECTED BY THE MAA-NLD

Occasionally, the MAA-NLD may grant an Operator an exemption to operate an aircraft outside the scope or limitations of the MEL. In such case the MAA-NLD will consider whether a change to the MEL is appropriate in order to support similar future operations in a more efficient way than through the exemption approval process.

In her determination whether a change to the MEL is appropriate the MAA-NLD will consult the Operator.

Refer to GM-MAR-MMEL/MEL.115.c.3 for similar changes that the MAA-NLD may direct to the MMEL.

GM MAR-MMEL/MEL.215.f

RECORD OF JUSTIFICATION

The Operator shall keep a record of justification substantiating any change relative to any MMEL-item in the MAA-NLD approved MMEL with respect to the minimum required number of items, the rectification interval category, the required operational and maintenance procedures and any additional remarks and dispatch considerations. Justifications of any items listed in addition to the MMEL shall be recorded to.

The changes and additions, and therefore the substantiations, will be focused on the integration of the Operator's own policies and of the operational regulations the Operator has to adhere to.

GM MAR-MMEL/MEL.220

- a. A model of an acceptable Preamble can be found in Appendix 4.
- b. The Preamble must make it clear that not all combinations of inoperative items are considered
- c. In addition to a Preamble arranged and worded along the lines of this Appendix 4, the MEL must contain, as part of the preamble, sufficient definitions and explanatory notes to provide the users (these are primarily flight crews and maintenance personnel) with a full and proper understanding of the intent and purpose of the items it contains.
While many of the definitions used will be common to all MELs, others will be specific to particular or individual aircraft types. The Operator shall ensure, when preparing the MEL, that all relevant definitions are included. Also explanatory notes shall be provided in sufficient detail wherever the intent and purpose of a term or phrase or abbreviation etc. is necessary or advisable.
- d. The MEL items list should normally be written in a 'five-column format'. Other formats may be accepted provided they are clear and unambiguous. Refer to the example in Appendix 2.
- e. Each item listed in the MEL should be described and identified in accordance with an appropriate code system acceptable to the MAA-NLD (e.g. ATA 100/2200, WUC, AECMA/ASD S1000D). Consistency of terminology and identification means should be

maintained, as far as possible, among aircraft documentation. When items apply to certain aircraft configurations only, this should be identified.

- f. Where a Message Oriented approach is used, the messages displayed may be listed in place of the item title in the relevant section, as this will be considered as a representation of the item(s) affected. Number installed and number required are not needed for such an approach. Refer to the example in Appendix 3.

GM MAR-MMEL/MEL.230

OPERATIONAL AND MAINTENANCE PROCEDURES

Operational and maintenance procedures are part of the MEL. They are an integral part of the compensating conditions needed to maintain an acceptable level of safety, enabling the MAA-NLD to approve the MEL. The MAA-NLD may request presentation of specific operational and/or maintenance procedures in the course of the MEL approval process.

Operational and maintenance procedures in the MEL shall not conflict with procedures in the AFM or Maintenance Manual.

Note: The condition 'Alternate procedures are established and used', or similar statement in the 'Remarks and exceptions' column, should be avoided as much as possible unless operational flexibility is required and adequate fulfilment of the condition can be expected from users in the field. Otherwise this condition shall be replaced by an explicit operational procedure to be followed by the crew.

ASSIGNMENT OF PROCEDURES

A decision on whether a necessary procedure can be assigned as an (O) or an (M) should be based on which is the most appropriately qualified trade to carry out the procedure and which trade would normally carry out such a task in their line of duty, based on the intended types of operation normally performed by the aircraft. On this basis deactivation and securing tasks should normally be assigned an (M) while procedures based on operation of equipment in the flight crew compartment should normally be assigned an (O).

PERIODICITY OF PERFORMANCE OF PROCEDURES

Maintenance deactivation procedures should normally be performed once prior to the first flight under the associated item. Maintenance verification procedures periodicity may vary and should therefore be clarified in the MEL.

Operational procedures should normally be performed or acknowledged by the flight crew members before each flight, unless otherwise specified.

GM MAR-MMEL/MEL.235

RECTIFICATION INTERVALS

The MEL is intended to permit operations with inoperative items for a period of time until rectifications can be accomplished. However, rectifications are to be accomplished at the earliest opportunity.

The MEL is **not** intended to permit dispatch after removal of operative items of equipment from serviceable aircraft.

The MEL is **not** intended as a tool for prolonged or permanent operation of aircraft in a configuration deviating from their certification status. For safety reasons such operation should be avoided to the

maximum possible. It is important therefore that rectifications be accomplished at the earliest opportunity in order that the affected aircraft can be returned to its certification status. In order to maintain this level, the MEL establishes limitations on the duration of operation with inoperative items. These are called Rectification Intervals and are designated A, B, C or D.

Notwithstanding the above, an aircraft may have installed (mission) equipment items which the Operator considers to be unnecessary for the type of operations the aircraft is used for. He may therefore want to delay rectification of such items for an indefinite period as long as that condition exists. In such cases the system should be deactivated, inhibited or removed through an appropriate maintenance procedure, and any type of operation for which the equipment is intended to be used should be prohibited through an appropriate operational procedure. Under these conditions time controlled rectification is not required and the Rectification Interval may be designated X.

USE OF CATEGORIES D AND X

The rectification interval category D is normally used for MEL items of an optional nature or items installed in excess of the requirements. If the items are not intended to be used in the types of operation the aircraft is used for, use of category X may be considered.

CATEGORY A VERSUS CATEGORY X

The difference between Category A items and Category X items is that for Category A items the application of operational limitations is not sufficient to maintain an acceptable level of safety. Category A items require in addition time-controlled rectification.

MULTIPLE INOPERATIVE ITEMS ALLOWED UNDER A SINGLE MEL-ITEM

For Category B, C and D items, multiple inoperative items may be allowed under a single MEL-item. In such case the rectification interval time shall start as soon as the minimum required number of items is reached. The remarks must therefore consider:

1. Operation with the maximum number of inoperative items for the duration of the rectification interval.
2. Operation with the maximum number of inoperative items, minus one, for an indefinite period of time.

In some cases it may be desirable to establish several MEL-items for a group of components/systems, each successive item providing for a lesser number required in combination with more stringent conditions. In all cases rectifications are to be accomplished as soon as possible, also when a formal rectification interval is not yet applicable.

GM MAR-MMEL/MEL.305

MEANS TO MAINTAIN THE LEVEL OF SAFETY

An acceptable level of safety can be maintained for an MMEL item through one or a combination of the following means:

1. Adjustment of operational limitations;
2. Transfer of the function/information to an operating system/component performing the required function or providing the required information, provided the change in crew workload and/or crew training remains acceptable;

3. Development of operational procedures (such as alternate procedures; additional pre-flight checks), provided the change in crew workload and/or crew training remains acceptable;
4. Development of maintenance procedures (such as deactivating and securing the system/component of concern, additional verification tasks).

ITEMS REQUIRED FOR EMERGENCY PROCEDURES

In the case a MMEL item is part of an emergency procedure, it should be demonstrated that the unavailability of this item does not impair the accomplishment of the emergency procedure.

Where an electrical function is required to accomplish an emergency procedure, the related minimum number of required systems or components are often powered by an emergency bus or equivalent. If so, these systems or components may not be included in the MMEL. Other systems or components, providing redundancy but not powered by the emergency bus or equivalent, may be inoperative within the conditions of the MMEL. For example: a radio powered by a 'normal' bus cannot be used as a back-up for a radio powered by an emergency bus. The other way around is acceptable though.

GM MAR-MMEL/MEL.310

QUALITATIVE SAFETY ASSESSMENT – CONSEQUENCES OF THE NEXT WORSE SAFETY RELATED FAILURE

Under MMEL conditions, the possibility of a single failure leading to a potentially hazardous or catastrophic failure condition is normally not allowed at dispatch.

QUALITATIVE SAFETY ASSESSMENT – LATENT FAILURES

Regarding MMEL dispatch configuration leaving the aircraft two failures away from a Catastrophic failure condition, particular attention should be paid to combinations involving failures which may be latent for more than one flight. Whenever practical, such combinations should be avoided per MMEL dispatch condition (e.g. verification task clearing the latent failure prior to each flight). Where these latent failures are not avoided, these combinations of failures should be highlighted and reviewed with the MAA-NLD.

QUALITATIVE SAFETY ASSESSMENT – MULTIPLE INOPERATIVE ITEMS

When a MMEL-item allows the unserviceability of a component or system that is required to be operative by another MMEL-item, the combination of the two MMEL-items shall be explicitly prohibited in the conditions of the MMEL.

QUALITATIVE SAFETY ASSESSMENT – PREVIOUS APPROVALS

The assessment may reflect experience with previous MMEL approvals. However, a previous MMEL approval of the same item on another aircraft type does not in itself imply that the level of safety is acceptable. Therefore, additional factors which could be considered include similarity of system operation and type of operations. A flight test or a simulator/STD evaluation, on an aircraft or STD representative of the type design, may be used to help evaluate a candidate MMEL item.

QUANTITATIVE SAFETY ASSESSMENT

Items for which a quantitative safety assessment is carried out to supplement the qualitative MMEL development process in accordance with the above-mentioned considerations should be reported.

Quantitative safety assessments should preferably be carried out by the OEMs of the aircraft type and the equipment considered. Other organizations may perform such assessments too, provided that

they have shown to have the required knowledge about the systems concerned. When integration aspects are relevant the MTCH shall coordinate the assessments.

Quantitative safety assessments of MMEL-items shall substantiate that the fleet average objectives for Catastrophic and Hazardous failure conditions will be maintained. These fleet average objectives shall be consistent with the level of safety as intended in the applicable certification base of the aircraft type.

Rectification intervals should primarily be based on operational considerations. Allowed MMEL rectification intervals may be considerably less than the maximum times calculated as per above criteria.

Rectification interval extensions, if any, should be considered in quantitative safety assessments (see MAR-MEL.135 and GM MAR-MEL.135).

USE OF THE EASA MMEL ITEMS GUIDANCE BOOK

As part of the guidance to its CS MMEL, EASA has issued a MMEL ITEMS GUIDANCE BOOK, providing guidance to OEMs for the preparation of MMEL items according to EASA regulations. In those cases where no information is available for MMEL items in the form of an OEM MMEL, this guidance book may be used by the MTCH to prepare the MMEL according to MAA-NLD regulations.

When applying the EASA MMEL ITEM GUIDANCE BOOK the MTCH shall take account of any differences between EASA and MAA-NLD (operational) regulations.

Hoofddorp, date: 7 November, 2016.

The Director Military Aviation Authority,



S.H.P.M. Pellemans

Colonel

APPENDIX 1: Example of a MMEL preamble

MILITARY AVIATION AUTHORITY of THE NETHERLANDS

MASTER MINIMUM EQUIPMENT LIST

PERMISSIBLE UNSERVICEABILITIES

(identify AIRCRAFT TYPE)

PREAMBLE

1. INTRODUCTION

The following is applicable for authorised certificate holders operating under the MAA-NLD's Operating Requirements (MAR-OPS). The MAR-OPS requires that all equipment installed on an aircraft in compliance with the Airworthiness Standards and the Operating Requirements must be operative. However, the Requirements also permit 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 component may not be necessary when the remaining operative equipment can provide an acceptable level of safety.

The MAA-NLD approved Master Minimum Equipment List (MMEL) is developed by the MTCH to improve aircraft operational availability. The MAA-NLD approved MMEL includes those items of equipment related to airworthiness and operating requirements and other items of equipment which the MAA-NLD finds may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations; it does not contain obviously required items such as wings, flaps, and rudders.

The MMEL is the basis for development of individual operator's MELs which take into consideration the operator's particular aircraft equipment configuration and operational conditions. An operator's MEL may differ in format from the MMEL, but cannot be less restrictive than the MMEL. The individual operator's MEL, when approved, permits operation of the aircraft with inoperative equipment.

Equipment not required by the operation being conducted and equipment in excess of MAR-OPS requirements are included in the MEL with appropriate conditions and limitations. The MEL must not deviate from Airworthiness Directives or any other Mandatory Requirement. It is important to remember that all equipment related to the airworthiness and the operating requirements of the aircraft not listed on the MMEL must be operative.

Suitable conditions and limitations in the form of placards, maintenance procedures, crew operating procedures and other restrictions as necessary are specified in the MEL to ensure that an acceptable level of safety is maintained.

The MEL is intended to permit operation with inoperative items of equipment for a period of time until rectifications can be accomplished. It is important that rectifications be accomplished at the earliest opportunity. In order to maintain an acceptable level of safety and reliability the MMEL establishes limitations on the duration of and conditions for operation with inoperative equipment. The MEL provides for release of the aircraft for flight with inoperative equipment.

The MEL is **not** intended to permit dispatch after removal of operative items of equipment from serviceable aircraft.

When an item of equipment is discovered to be inoperative, it is reported by making an entry in the Aircraft Maintenance Record/Logbook as prescribed by the MAR-OPS. The item is then either rectified or may be deferred per the MEL or other approval means acceptable to the MAA-NLD prior to further

operation. MEL conditions and limitations do not relieve the operator from determining that the aircraft is in a condition for safe operation with items of equipment inoperative.

When these requirements are met, an Airworthiness Release, Aircraft Maintenance Record/Logbook entry, or other approved documentation is issued as prescribed by MAR-OPS. Such documentation is required prior to operation with any item of equipment inoperative.

Operators are responsible for exercising the necessary operational control to ensure that an acceptable level of safety is maintained. The exposure to additional failures during continued operation with inoperative systems or components must also be considered. Wherever possible account has been taken in this MMEL of multiple inoperative items. However, it is unlikely that all possible combinations of this nature have been accounted for. Therefore, when operating with multiple inoperative items, the inter-relationships between those items and the effect on aircraft operation and crew workload must be considered.

Operators are to establish a controlled and sound rectification programme including the parts, personnel, facilities, procedures and schedules to ensure timely rectification. This programme should identify the actions required for maintenance discrepancy messages.

WHEN USING THE MEL, COMPLIANCE WITH THE STATED INTENT OF THE PREAMBLE, DEFINITIONS AND THE CONDITIONS AND LIMITATIONS SPECIFIED IN THE MEL IS REQUIRED.

2. RECTIFICATION INTERVAL CATEGORIES

a. Rectification Interval Categories are defined as follows:

Category A

No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the Remarks column (*see the proposed tabular formats given in Appendices 2 and 3 for the technical pages of the MMEL*) of the MMEL.

Where a time period is specified in calendar days or flight days, the interval excludes the day of discovery.

Where a time period is specified other than in calendar days or flight days, it shall start at the point when the defect is deferred in accordance with the Operator's approved MEL.

Category B

Items in this category shall be rectified within three (3) consecutive calendar days, excluding the day of discovery.

Category C

Items in this category shall be rectified within ten (10) consecutive calendar days, excluding the day of discovery.

Category D

Items in this category shall be rectified within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

Category X

Items in this category do not require time controlled rectification.

b. Multiple inoperative items allowed under a single MEL-item.

For Category B, C and D items, the rectification interval time starts as soon as the minimum required number of items is reached. However, the remarks are applicable as soon as the first item becomes inoperative.

In all cases rectifications are to be accomplished as soon as possible, also when a formal rectification interval is not yet applicable.

4. RECTIFICATION INTERVAL EXTENSIONS

(Note; Insert here the appropriate statement A or B:

A: For the items with a B, C or D Rectification Interval no Rectification Interval Extensions have been taken into account in the determination of the Rectification Intervals.

B: For the items with a B, C or D Rectification Interval, a one-time Rectification Interval Extension, of the same duration as the applicable Rectification Interval for the item concerned, has been taken into account in the determination of the Rectification Intervals.

Note: The use of Rectification Interval Extensions by the Operator is subject to the approval of the MAA-NLD)

5. DEFINITIONS

For the purpose of this MMEL the following definitions shall apply: *(include an appropriate list of definitions here. The following list is not an exhaustive list and MTC-holders should include in their MMELs any definition that is considered to be relevant.)*

'Any in excess of those required by regulations' means that the listed items required by applicable legislation (applicable airworthiness, operational or airspace requirements) must be operative and only excess items may be inoperative. The minimum amount of items specified by the Certificate Base of the Type shall at least be covered in the 'number required for dispatch'-column. When the (excess) items are not required, they may be inoperative for the time specified by its rectification interval category.

'As required by applicable regulations', means that the listed item is subject to certain provisions (restrictive or permissive) expressed in the applicable legislation. When the item is not required, it may be inoperative for the time specified by its rectification interval category.

'Calendar Day' means a 24-hour period from midnight to midnight based on either UTC or local time, as selected by the Operator. All calendar days are considered to run consecutively.

'Combustible Material' means the material which is capable of catching fire and burning. In particular: if a MEL item prohibits loading of combustible (or flammable or inflammable) material, no material may be loaded except the following:

- 1. Cargo handling equipment (unloaded, empty or with ballast).*
- 2. Fly away kits (excluding e.g. cans of hydraulic fluid, cleaning solvents, batteries, capacitors, chemical generators, etc.); Note: If serviceable tyres are included, they should only be inflated to a minimum pressure that preserves their serviceability.*
- 3. Inflight service material (return catering — only closed catering trolleys/boxes, no newspapers, no alcohol or duty free goods).*

'Commencement of flight' is the point when an aircraft begins to move under its own power for the purpose of preparing for take-off. For aircraft that are launched into flight this moment is defined by the activation of the launching mechanism.

'Considered inoperative', as used in the dispatch conditions, means that item must be treated for dispatch, taxiing and flight purposes as though it were inoperative. The item shall not be used or operated until the original deferred item is repaired. Additional actions include: documenting the item on the dispatch release (if applicable), placarding, and complying with all remarks, exceptions, and related MEL provisions, including any (M) and (O) procedures and observing the rectification interval.

'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.

'Day of discovery' means the calendar day that a malfunction was recorded in the aircraft maintenance record/log book.

'Deactivated' and 'secured' means that the specified component must be put into an acceptable condition for safe flight.

'ETOPS' or 'ER operations' refers to extended range operations of a two-engine airplane as defined by MAR OPS 1.1340.

'External Event' An occurrence which has its origin distinct from the aircraft or the system being examined, such as atmospheric conditions (e.g. wind gusts/shear, temperature variations, icing, lightning strikes), operating environment (e.g. runway conditions, conditions of communication, navigation and surveillance services), cabin and baggage fires, and bird strike.

'Flight', for the purposes of the MEL, means the period of time between the moment of commencement of flight until the moment the aircraft comes to a complete stop on its parking area, after the first landing.

"Flight Day" means a 24 hour period (from midnight to midnight) either UTC or local time, as selected by the Operator, during which at least one flight is initiated for the affected aircraft.

'Icing Conditions' means an atmospheric environment that may cause ice to form on the aircraft or in the engine(s) as defined in the AFM/RFM.

'If installed' means that the item is not required to be installed on all aircraft covered by the MEL.

'Inoperative' The item does not accomplish its intended purpose or is not consistently functioning within its design operating limits or tolerances. Some items have been designed to be fault tolerant and are monitored by computers which transmit fault messages to a centralized computer for the purpose of maintenance. The presence of this category of message does not mean that the item is inoperative.

'Intended route' corresponds to any point on the route including diversions to reach alternate aerodromes required to be selected by the operational rules.

'Is not used', in the provisos, remarks or exceptions for a MEL item, may specify that another item relieved in the MEL 'is not used'. In such cases, crew members should not activate, actuate, or otherwise utilize that component or system under normal operations. It is not necessary for the Operators to accomplish the (M) procedures associated with the item. However, operations-related provisions, (O) procedures and rectification interval must be complied with. An additional placard must be affixed, to the extent practical, adjacent to the control or indicator

for the item that is not used to inform crew members that a component or system is not to be used under normal operations.

'Item' means instrument, equipment or function.

'(M)' indicates a requirement for a specific maintenance procedure which must be accomplished prior to operation with the listed item inoperative. Normally these procedures are accomplished by maintenance personnel; however, other personnel may be qualified and authorised to perform certain functions. The satisfactory accomplishment of all maintenance procedures, regardless of who performs them, is the responsibility of the Operator. Appropriate procedures are required to be published as part of the Operations Manual or MEL.

"Non-safety related item" An item that is not related to the airworthiness of the aircraft and is not required by operational regulations or the operating procedures as specified in the Operations Manual.

'Notes' provide additional information for flight crew or maintenance consideration. Notes are used to identify applicable material which is intended to assist with compliance, but do not relieve the Operator of the responsibility for compliance with all applicable requirements. Notes are not a part of the dispatch conditions.

'Number installed' is the number (quantity) of items normally installed in the aircraft. This number represents the aircraft configuration(s) considered in developing the MEL. Should the number be a variable (e.g. passenger cabin items), a number is not required; a '-' is then inserted.

'Number required for dispatch' is the minimum number (quantity) of items required for operation provided the conditions specified are met. Should the number be a variable (e.g. passenger cabin items), a number is not required; a '-' is then inserted.
Note: Where the MEL shows a variable number required for dispatch, the MEL should reflect a means of configuration control approved by the MAA-NLD.

'(O)' indicates a requirement for a specific operations procedure which must be accomplished in planning for and/or operating with the listed item inoperative. Normally these procedures are accomplished by the flight crew; however, other personnel may be qualified and authorised to perform certain functions. The satisfactory accomplishment of all procedures, regardless of who performs them, is the responsibility of the Operator. Appropriate procedures are required to be published as a part of the Operations Manual or MEL.

'Operating minima' means the set of requirements associated to operations requiring a specific approval (refer to MAR OPS).

'Placarding' Each inoperative item must be placarded, as applicable, to inform and remind the crew members and maintenance personnel of the item's condition. Note: To the extent practical, placards should be located adjacent to the control or indicator for the item affected; however, unless otherwise specified, placard wording and location will be determined by the Operator.

'Rectification Interval' A limitation on the duration of operations with inoperative items.

'Remarks/Dispatch Considerations' include statements either prohibiting or allowing operation with a specific number of items inoperative, provisos (conditions and limitations), notes, (M) and/or (O) symbols, as appropriate for such operation.

'Required Cabin Crew Seat' is a seat in the aircraft cabin which meets the following conditions:

1. Where the certification of the cabin requires this seat to be occupied by a qualified cabin crew member as specified in the Operations Manual, and;

2. *This seat is a part of the station to which a qualified cabin crew member is assigned for the flight, and;*
3. *The qualified cabin crew member assigned to the station is a member of the minimum cabin crew designated for the flight.*

'RPAS' An abbreviation for Remotely Piloted Aircraft System.

'Visible Moisture' means an atmospheric environment containing water in any form that can be seen in natural or artificial light; for example, clouds, fog, rain, sleet, hail, or snow.

'-' in the Number Required for Dispatch Column indicates a variable number (quantity) of the item required.

6. CENTRALISED MESSAGE SYSTEMS (Note; Include a section on Centralised Message Systems only if appropriate)

This aircraft type is equipped with a system which provides different levels of systems information messages (Warning, Caution, Advisory, Status, Maintenance etc.). Any aircraft discrepancy message that affects dispatch will normally be at Status message level or higher.

Therefore, systems conditions that result only in a Maintenance Message are not normally addressed in the MMEL as they, in themselves, do not prohibit dispatch of the aircraft. However, maintenance discrepancy messages, must be recorded and corrected in accordance with the approved maintenance programme.

7. RPAS EQUIPMENT CONTROLLED BY THE MMEL (Note; Include a section on RPAS equipment only for Remotely Piloted Aircraft Systems)

This MMEL controls the following equipment of the (identify the name of the RPAS) system: (Identify the main components controlled by the MMEL, like the air vehicle(s), the control station(s), the launch unit(s), the dedicated air data links and power supplies etc. of the RPAS.)

8. REFERENCES

This MMEL is based on the following documents:

List here all source documents the MMEL is based upon, including their revision status.

APPENDIX 2: Example of an item oriented (M)MEL format

Note: Words between brackets apply to the format of the Master MEL

**MILITARY AVIATION AUTHORITY of THE NETHERLANDS
(MASTER) MINIMUM EQUIPMENT LIST**

AIRCRAFT (TYPE):	REVISION NO: DATE:	PAGE
(1) Systems & sequence numbers Item	(2) Rectification Interval Category	
	(3) Number installed	
	(4) Number required for dispatch	
	(5) Remarks/Dispatch considerations	

APPENDIX 3: Example of a message oriented (M)MEL format

Note: Words between brackets apply to the format of the Master MEL

**MILITARY AVIATION AUTHORITY of THE NETHERLANDS
(MASTER) MINIMUM EQUIPMENT LIST**

AIRCRAFT (TYPE):	REVISION NO: DATE:	PAGE
(1) Message	(2) Rectification Interval Category	
	(3) Remarks/Dispatch Consideration	

APPENDIX 4: Example of a MEL preamble

MILITARY AVIATION AUTHORITY of THE NETHERLANDS
(identify OPERATORS NAME)
MINIMUM EQUIPMENT LIST
PERMISSIBLE UNSERVICEABILITIES
(identify AIRCRAFT TYPE)
PREAMBLE

1. INTRODUCTION

The MEL is intended to permit operations with inoperative items of equipment for a period of time until rectifications can be accomplished. However, rectifications are to be accomplished at the earliest opportunity.

Airworthiness Directives and other Mandatory Requirements take precedence over the conditions in this MEL.

MEL conditions and limitations do not relieve the Commander from determining that the aircraft is in a fit condition for safe operation with specified inoperative items allowed by the MEL.

The provisions of the MEL are applicable until the aircraft commences the flight. Any decision to continue a flight following a failure or unserviceability which becomes apparent after the commencement of a flight must be the subject of pilot judgement and good airmanship. The Commander may continue to make reference to and make use of the MEL as appropriate.

By approval of the MEL the MAA-NLD permits dispatch of the aircraft for mission, ferry or training flights with certain items or components inoperative provided an acceptable level of safety is maintained by use of appropriate operational or maintenance procedures, by transfer of the function to another operating component, or by reference to other instruments or components providing the required information.

The MEL is **not** intended to permit dispatch after removal of operative items of equipment from serviceable aircraft.

Note: For dispatch with airframe or engine parts missing refer to the CONFIGURATION DEVIATION LIST (CDL), if available.

2. CONTENTS OF MEL

The MAA-NLD approved part of the MEL contains only those items required by the Operating Regulations or the operating procedures in the Operations Manual or those items of airworthiness significance which may be inoperative prior to dispatch, provided that appropriate limitations and procedures are observed. Equipment obviously basic to aircraft airworthiness such as wings, rudders, flaps, engines, landing gear, etc. are not listed and must be operative for all flights. It is important to note that:

ALL ITEMS NOT INCLUDED IN THE LIST ARE REQUIRED TO BE OPERATIVE UNLESS THEY ARE CONSIDERED TO BE NON-SAFETY RELATED ITEMS.

This MEL may contain dispatch information on non-safety related items, such as galley equipment or passenger convenience items. These items are not subject to MAA-NLD approval and are provided by the Operator for operational efficiency only. These items, if present, are explicitly marked with the words "Non safety related item".

3. CRITERIA FOR DISPATCH

Prior to operation with any item inoperative acceptance by the crew is required in accordance with appropriate procedures.

The decision of the Commander of the flight to have allowable inoperative items corrected prior to flight will take precedence over the provisions contained in the MEL. The Commander may request requirements above the minimum listed, whenever in his judgement such added items are essential to the safety of a particular flight under the special conditions prevailing at the time.

The MEL cannot take into account all multiple inoperative items. Therefore, before dispatching an aircraft with multiple MEL items inoperative, it must be assured that any interface or inter-relationship between inoperative items will not result in a degradation in the level of safety and/or an undue increase in crew workload. It is particularly in this area of multiple discrepancies and especially discrepancies in related systems, that good judgement, based on the circumstances of the case, including climatic and en-route conditions must be used.

4. MAINTENANCE ACTION

When an item is discovered to be inoperative, it is reported by making an entry in the Aircraft Maintenance Record/Logbook as prescribed by the MAR-OPS. The malfunction must be recorded ultimately on the same day that the flight, test or maintenance task during which the malfunction is discovered ends. The day the malfunction is recorded is by definition 'the day of discovery'. Following sufficient fault identification, the item is then either rectified or may be deferred per the MEL or other approval means acceptable to the MAA-NLD prior to further operation. MEL conditions and limitations do not relieve the Operator from determining that the aircraft is in a condition for safe operation with items of equipment inoperative.

When these requirements are met, an Airworthiness Release, Aircraft Maintenance Record/Logbook entry, or other approved documentation is issued as prescribed by MAR-OPS. Such documentation is required prior to operation with any item of equipment inoperative.

Every effort shall be made by Maintenance to correct all technical defects as early as practicable and that the aircraft be released from a maintenance station in fully operational condition. The Commander

must be informed by Maintenance as soon as practicable, should it be impossible to rectify the inoperative item prior to departure.

Whenever an aircraft is released by Maintenance for dispatch with items inoperative, the following is required:

- (a) The technical logbook of the aircraft must contain a detailed description of the inoperative item(s), special advice to the flight crew, if necessary, and information about corrective action taken.
- (b) When they are accessible to the crew in flight, the control(s), and/or indicator(s) related to inoperative unit(s) or component(s) must be clearly placarded.

Note: To the extent practical, placards should be located adjacent to the control or indicator for the item affected; however, unless otherwise specified, placard wording and location should be determined by the Operator.

- (c) If inadvertent operation could produce a hazard such equipment must be rendered inoperative (physically) as given in the appropriate Maintenance Procedure.
- (d) The relevant Operational and Maintenance Procedures are contained in (*identify the particular Manual, Section, Chapter or Part etc. authorised by the appropriate Authority*).

Note: Unless specifically allowed by this MEL, inoperative instruments or equipment should not be removed from the aircraft.

Specific procedures regarding the deferral of MEL items are specified in (*identify applicable sections of the Operations Manual*).

5. INTERMITTENT MALFUNCTIONS

Intermittent malfunctions, occurring and disappearing on a single flight, should be reviewed by the aircrew and maintenance crew to decide on whether they should be entered in the Aircraft Maintenance Record/Logbook as a malfunction or not.

Intermittent malfunctions, occurring and disappearing repetitively over a number of flights, require special attention. When a malfunction is reported in the Aircraft Maintenance Record/Logbook the item may be deferred according to the conditions of the MEL. When during inspection, whether after corrective maintenance action or not, the item appears to function correctly again it may be removed from the deferred items list. In case of an intermittent defect this may repeat itself several times. Each time the defect occurs it must be reported.

It is up to the competence of the personnel involved (crewmembers and maintenance personnel) to assess the situation and to decide how to deal with the apparent intermittent defect. Criteria in the assessment should amongst others be the probability of occurrence, the risks involved and the available mitigating means.

6. RECTIFICATION INTERVALS

The MEL is **not** intended as a tool for prolonged or permanent operation of aircraft in a configuration deviating from their certification status. For safety reasons such operation should be avoided to the maximum possible. It is important therefore that rectifications be accomplished at the earliest opportunity in order that the affected aircraft can be returned to its certification status. In order to maintain this level, the MEL establishes limitations on the duration of operation with inoperative items, as follows:

Inoperative items, deferred in accordance with the MEL, must be rectified at or prior to the rectification intervals established by the following letter designators given in the "Rectification Interval Category" column of the MEL.

Category A

No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the 'Remarks' column (*see the proposed tabular formats given in Appendices 2 and 3 for the technical pages of the MEL*) of the MEL.

Where a time period is specified in calendar days it shall start on the calendar day following the day of discovery.

Where a time period is specified other than in calendar days, it shall start at the point when the defect is deferred in accordance with the Operator's approved MEL.

Category B

Items in this category shall be rectified within three (3) consecutive calendar days, excluding the day of discovery.

Category C

Items in this category shall be rectified within ten (10) consecutive calendar days, excluding the day of discovery.

Category D

Items in this category shall be rectified within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

Category X

Items in this category do not require time controlled rectification.

7. MULTIPLE INOPERATIVE ITEMS ALLOWED UNDER A SINGLE MEL-ITEM

For Category B, C and D items, the rectification interval time starts as soon as the minimum required number of items is reached. However, the remarks are applicable as soon as the first item becomes inoperative.

In all cases rectifications are to be accomplished as soon as possible, also when a formal rectification interval is not yet applicable.

8. RECTIFICATION INTERVAL EXTENSIONS (*Note; Include a section on Rectification Interval Extensions only if appropriate*)

Subject to the approval of the MAA-NLD, the Operator may use a procedure for the extension of the applicable Rectification Intervals B, C and D, for the same duration as specified in the MEL in accordance with MAR-OPS regulations. Specify or refer to the applicable procedure here.

9. DEFINITIONS

For the purpose of this MEL the following definitions shall apply: (*include an appropriate list of definitions here. An example can found in Appendix 1, but it should be noted that the list in Appendix 1 is not an exhaustive list and Operators should include in their MELs any definition which is considered to be relevant.*)

10. CENTRALISED MESSAGE SYSTEMS (Note; Include a section on Centralised Message Systems only if appropriate)

This aircraft is equipped with a system which provides different levels of systems information messages (Warning, Caution, Advisory, Status, Maintenance etc.). Any aircraft discrepancy message that affects dispatch will normally be at Status message level or higher.

Therefore, systems conditions that result only in a Maintenance Message are not normally addressed in the MEL as they, in themselves, do not prohibit dispatch of the aircraft. However, maintenance discrepancy messages, must be recorded and corrected in accordance with the approved maintenance programme.

11. RPAS EQUIPMENT CONTROLLED BY THE MEL (Note; Include a section on RPAS equipment only for Remotely Piloted Aircraft Systems)

This MEL controls the following equipment of the (identify the name of the RPAS) system: (Identify the main components controlled by the MEL, like the air vehicle(s), the control station(s), the launch unit(s), the dedicated air data links and power supplies etc. of the RPAS.)

12. References

List in this section all the documents upon which the MEL is based, including their revision status.