



getting to grips with
MMEL and MEL

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getting to grips with MMEL and MEL

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FOREWORD

The purpose of this "Getting to Grips with MMEL and MEL" Brochure is:

- To help Airbus Operators understand the Master Minimum Equipment List (MMEL) and the Minimum Equipment List (MEL)
- To explain how the Airbus MMEL is created and approved/accepted
- To provide guidance material for the creation and the use of the MEL.

The MMEL is an Airbus document, developed by the Flight Operations Support and Services Department. Operators use the Airbus MMEL as a reference for creating their own MEL, which is provided to their flight crews, line maintenance personnel, and/or flight operations personnel. It is important to note that an Operator's MEL cannot be less restrictive than the Airbus MMEL.

Both the MMEL and the MEL are legal documents that are either approved or accepted by Airworthiness Authorities.

The MMEL and the MEL consist of component and system lists that are attributed a "GO", "GO IF", or "NO GO" status, depending on their impact on the safety of a flight. These attributes are defined as follows:

- "GO" or "GO IF" items can remain inoperative for a limited period of time.
- "NO GO" items prevent the dispatch of the aircraft.

The MMEL and the MEL are both designed to ensure that an acceptable level of safety is respected, when an aircraft is dispatched with inoperative equipment. The MEL enables Operators to rapidly dispatch an aircraft, and avoid unnecessary delays or flight cancellations, without sacrificing safety.

This brochure is primarily designed to provide Operators with assistance in developing and optimizing their own MEL.

Please submit any questions you may have concerning this brochure to:

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EXECUTIVE SUMMARY

Chapter 1: General

MMEL/MEL General Presentation

The objective of the MMEL is to ensure:

- An acceptable level of safety, while operating an aircraft with inoperative equipment
- Aircraft profitability by avoiding Aircraft On Ground (AOG) situations.



MMEL/MEL Legal Bases

The applicable documents that serve as the reference for the creation of the MMEL and the MEL are provided by either Joint Aviation Authorities (JAA) or Federal Aviation Administration (FAA) documents.

These documents are:



Airworthiness Directives (ADs), published as a result of an in-flight event, always supersede any published MMEL/MEL dispatch requirement.

Chapter 2: MMEL Development Process

Development Principles to Justify Dispatch Conditions

Before proposing a new MMEL item to Airworthiness Authorities, the Airbus Flight Operations MMEL Department and safety specialists must substantiate the ability to **maintain an “acceptable level of safety” as required by an applicable regulation**, even if a specific system is inoperative.

Rectification Intervals

To maintain this “acceptable level of safety”, and to prevent degraded maintenance, the MMEL establishes limitations on the amount of time that an aircraft can be operated with inoperative items.

Rectification Intervals	A	B	C	D
Consecutive Calendar Days (excluding the day of discovery)	No standard Rectification Interval (refer to dispatch conditions)	3	10	120

Rectification Intervals B, C, and D may be extended one time.

Failure Classification

For the A320 and the A330/A340 families, the Central Maintenance System (CMS) or the Centralized Fault Display System (CFDS) centralize the failures, and classify them, based on their effect on safety and in the cockpit. Only Class I failures may prevent aircraft dispatch and are addressed in the MMEL.

Chapter 3: Master Minimum Equipment List (MMEL)

Organization of the MMEL

The MMEL has four, or five (depending on the aircraft family), sections:

- **Section 00:** General information about the manual (organization, approval sheet, highlights...).
- **Section 00E:** List of ECAM warnings, and associated MMEL entries (if applicable), classified according to the ATA breakdown.
- **Section 01:** The approved/accepted part of the MMEL: All items that may be inoperative, their Rectification Intervals, their number installed, their number required for dispatch, and their associated remarks or exceptions.
- **Section 02:** The operational procedures required by Section 01. Due to the fact that the content of these procedures is not approved/accepted, Operators may choose not to follow Airbus procedures, and may create their own procedures.
- **Section 03:** Maintenance procedures extracted from the Aircraft Maintenance Manual (AMM), and required by Section 01. This Section is only available for the A300/A310 and A320 family.

MMEL Amendments (JAA Model)

An MMEL amendment is made via:

- Normal Revisions
- Temporary Revisions

The MMEL is:

- Approved by the DGAC for the A300 B2/B4 and A300/A310.
- Accepted by the JAA for the A320 family and the A330/A340. Then, the JAA recommends approval of these MMELs to National Authorities.

MMEL Amendments (FAA model)

An MMEL amendment is made via:

- Normal Revisions
- Interim Revisions

The MMEL is written and approved by the FAA for all Airbus families. However, an FAA MMEL is only created and published if the aircraft type is operated by FAA Operators.

Chapter 4: Minimum Equipment List (MEL)

From the DGAC/JAA MMEL to the MEL

Based on the MMEL, Operators create their own MEL, and obtain approval from their applicable National Authorities.

The DGAC/JAA MEL development process can include the following steps:

- 1) Definition of the MEL content
- 2) Review of "Reserved" Items
- 3) Review of "(If Installed)" Items
- 4) Review of "As required by regulations" Items
- 5) Review of Special Operations.

From the FAA MMEL to the MEL

The FAA MEL development process can include the following steps:

- 1) Definition of the MEL content
- 2) Check the applicability of each MMEL item
- 3) Review of "As required by FAR" Items
- 4) Review of Special Operations
- 5) Include the content of the (o) and (m) procedures.

MEL User Guide

The aim of the MEL is not to encourage aircraft operation with inoperative equipment, because it is not desirable for an aircraft to be dispatched in these conditions, and such a situation is permitted only as a result of careful analysis.

The MEL should, therefore, be consulted on ground, and only when a failure has been identified and confirmed.

Limits of MEL Applicability

According to the JAR MMEL/MEL.001, an MEL is applicable up to the commencement of the flight (i.e. the point when the aircraft begins to move under its own power, in preparation for takeoff).

In some cases, the MEL may need to be consulted in flight, in order to decide if it is necessary to perform an in-flight turn back. However, any decision to continue the flight must be subject to pilot judgment.

If there is an in-flight failure, the FCOM provides the procedures and limitations that the flight crew should apply.

Chapter 5: MMEL Evolutions

Less Paper in the Cockpit (LPC)

- **LPC Concept**

In 1998, Airbus decided to implement the Less Paper in the Cockpit (LPC) project. This concept is now available on all Fly-By-Wire aircraft and is based on conventional laptop PCs. It aims at reducing the amount of paper in a standard pilot flight bag.

The LPC package contains:

- A takeoff module
- A landing module
- A Weight and Balance (W&B) module
- An e-FCOM
- An e-MEL.

- **LPC e-MEL**

The LPC e-MEL tool is an electronic version of the MEL that provides quick and easy access to the information that is required in order to dispatch an aircraft.

This version is based on the paper MMEL and has five main parts:

- ECAM messages, and corresponding links to dispatch conditions
- Item breakdown, and corresponding dispatch conditions
- Operational procedures
- AMM deactivation tasks
- Operator documents.

The LPC e-MEL enables Operators to create and to consult their own MEL, according to local requirements, via two modules:

- The administrator module that deals with the customization of the MEL
- The MEL consultation module.

ABBREVIATIONS

§	Paragraph
-A-	
A/C	Aircraft
ACJ	Advisory Circular Joint
ACARS	Aircraft Communications Addressing and Reporting System
AD	Airworthiness Directive
ADPM	Aircraft Deactivation Procedures Manual
AFM	Aircraft Flight Manual
AMM	Aircraft Maintenance Manual
AOG	Aircraft On Ground
ATA	Air Transportation Association
ATC	Air Traffic Control
-B-	
BBS	Bulletin Board System
-C-	
CAT	Category
CDL	Configuration Deviation List
CFDS	Centralized Fault Display System
CG	Center of Gravity
CMS	Central Maintenance System
CMP	Configuration, Maintenance and Procedures
CRT	Cross-Reference Table
-D-	
DDG	Dispatch Deviation Guide
DGAC	Direction Générale de l'Aviation Civile (French Civil Aviation Authorities)
DH	Decision Height
-E-	
ECAM	Electronic Centralized Aircraft Monitoring
EIS	Entry Into Service
ER	Extended Range
ETOPS	Extended Twin Operations
-F-	
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FAR	Federal Aviation Regulations
FCOM	Flight Crew Operating Manual
FDE	Flight Deck Effect
FL	Flight Level
FOEB	Federal Operations Evaluation Board (FAA)
FOSP	Flight Operations Standard Package
FOVE	Flight Operations Versatile Environment
FQI	Fuel Quantity Indicating/Indication/Indicator
FWC	Flight Warning Computer

-H-

HTML Hyper Text Markup Language

-I-

ICAO International Civil Aviation Organization

IR Intermediate Revision

-J-

JAA Joint Aviation Authorities

JAR Joint Aviation Requirements

JOEB Joint Operations Evaluation Board (JAA)

-K-

Kg Kilogram

-L-

LEP List of Effective Pages

LETR List of Effective Temporary Revisions

LPC Less Paper in the Cockpit

-M-

MCC Maintenance Control Center

MCDU Multipurpose Control and Display Unit

MEL Minimum Equipment List

MFA Memorized Fault Annunciator

MMEL Master Minimum Equipment List

MOD Modification

MP Modification Proposal

MSN Manufacturer Serial Number

-N-

NAA National Aviation Authorities

NM Nautical Mile

NTO No Technical Objection

-O-

OCC Operations Control Center

OEG Operational Evaluation Group (DGAC)

-P-

PC Personal Computer

PL Policy Letter

-Q-

QRH Quick Reference Handbook

-R-

REV Revision

RIE Rectification Interval Extension

RNP Required Navigation Performance

RVR Runway Visual Range

RVSM Reduced Vertical Separation Minimum

-S-

SB	Service Bulletin
SEQ	Sequence
SGML	Standard General Markup Language
SOP	Standard Operating Procedure
SSA	System Safety Assessment
STD	Standard

-T-

TC	Type Certificate
TGL	Temporary Guidance Leaflet
TOCG	Take Off Center of Gravity
TOW	Take Off Weight
TR	Temporary Revision

-U-

US	United States
UTC	Universal Coordinated Time

-W-

W&B	Weight and Balance
WBM	Weight and Balance Manual

-X-

XML	eXtended Mark-up Language
-----	---------------------------

-Z-

ZFCG	Zero Fuel Center of Gravity
ZFW	Zero Fuel Weight

DEFINITIONS

The following are standard definitions of some of the MMEL/MEL related terms that are utilized throughout this brochure.

Item: An item is either a piece of equipment, a function, an instrument, or a system listed in the MMEL.

Revenue Flight: A revenue flight is any scheduled or non-scheduled air service performed by aircraft for the public transport of passengers, mail, or cargo, for remuneration or hire.

Non-revenue Flight:

A non-revenue flight is not a revenue flight such as:

- Training flights
- Test flights
- Delivery flights
- Ferry flights (flight flown for a positioning, or other purpose, such as to enable the aircraft to undergo maintenance)
- Demonstration flights
- Positioning flights

MMEL: The MMEL lists all the safety-related items for which revenue flights are permitted, even if the items are inoperative at departure. The MMEL specifies the dispatch conditions: The conditions to be fulfilled and the procedures to be performed, in order to permit the revenue flights to be flown with the inoperative item for a limited period of time.

The MMEL serves as a basis for Operators in developing their own MEL.

MEL: The MEL is a required document, which must be created for each aircraft in an Operator's fleet. It is based on the aircraft MMEL, and includes the specific requirements of each National Authority. Furthermore, the MEL must be customized to take into account the specificities of each aircraft: Weight variant, options installed, software upgrades, hardware upgrades, retrofit status...

It is important to note that the MEL cannot be less restrictive than the MMEL.

Dispatch Conditions:

The dispatch conditions are the conditions, given in Section 01 of the MMEL, to be fulfilled, in order to allow aircraft operation with a specific item inoperative.

"GO":

An MMEL "GO" item is a safety-related item that may be inoperative at the dispatch of the aircraft without any specific condition or restriction.

MMEL "GO" items are addressed in the MMEL and have no dispatch condition.

However, a "GO" item always has a time limit, within which the failure must be corrected. This period of time is referred to as "Rectification Interval".

"GO IF":

An MMEL "GO IF" item is a safety-related item that may be inoperative at the dispatch of the aircraft provided dispatch conditions are satisfied and/or specific restrictions are applied.

"GO IF" items are listed in the MMEL and have dispatch conditions requiring:

- Actions to be done, and/or
- Other equipment to be operative, and/or
- Checks to be performed, and/or
- Limitations to be taken into account, and/or
- Performance calculations to be computed, and/or
- Details on the conditions in which the item can be inoperative, and/or
- ...

"NO GO":

A piece of equipment, a function, an instrument, or a system... is called "NO GO" if it must be operative in order to permit the dispatch of the aircraft for a revenue flight. Generally, the MMEL does not list "NO GO".

All equipment/functions/instruments/systems related to the airworthiness of the aircraft, and not listed in the MMEL, are automatically required to be operative for dispatch (e.g. Wings, engines, etc).

(Refer to §3.2.5)

Inoperative:

An item is deemed to be "inoperative", when it does not satisfactorily fulfill its intended function, regardless of the reason.

Therefore, an item is deemed to be inoperative, when:

- It does not work at all, or
- It does not perform one or more of the functions for which it was designed, or
- It does not consistently work within its designed operating limits or tolerances, or
- It is requested to be considered inoperative by the dispatch conditions, or
- It is not available due to a primary failure.



1. GENERAL

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1.1. INTRODUCTION

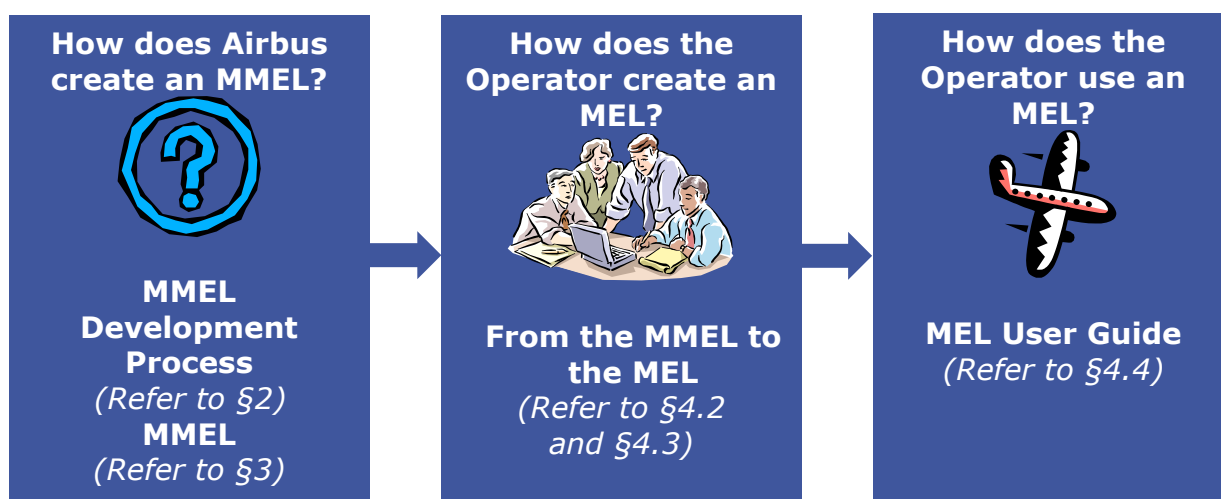
The Master Minimum Equipment List (MMEL) and the Minimum Equipment List (MEL) deal with system failures that have an impact on the safety of the aircraft.

Failures can have various effects on the aircraft, depending on the importance of the component within the system(s).

Obviously, the failure of a reading light in the cabin will not affect safety and should, therefore, not prevent aircraft dispatch. On the other hand, no Operator would envisage dispatching an aircraft with an inoperative engine. However, in the case of a failed secondary hydraulic system indicator, it is not easy for an Operator to determine if it is possible to dispatch the aircraft, due to the fact that the aircraft has three independent hydraulic systems.

The purpose of the MMEL is to provide Operators with an efficient and reliable tool to rapidly determine if the aircraft can be dispatched without compromising the safety of the flight.

This brochure will attempt to answer the following three important questions:



1.2. HISTORICAL BACKGROUND



The International Civil Aviation Organization (ICAO), a specialized United Nations agency, was created on December 7, 1944 with the signing of the **Convention on International Civil Aviation**, in Chicago (U.S.A). The convention consists of 96 articles that establish the privileges and restrictions of all contracting states, and provide for the adoption of International Standards And Recommended Practices (SARPs) that regulate international air transportation.

The establishment of this convention was the first step in the creation of international regulations for air transportation, and provides the following official definition of the Minimum Equipment List (MEL) in "Annex 6- Chapter 6: Aeroplane instruments, equipment and flight documents":

6.1.2 The operator shall include in the operations manual a minimum equipment list (MEL), approved by the State of the Operator which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative. Where the State of the Operator is not the State of Registry, the State of the Operator shall ensure that the MEL does not affect the aeroplane's compliance with the airworthiness requirements applicable in the State of Registry.

Note.- Attachment G contains guidance on the minimum equipment list.

Figure 1-1: Extract 1 from the ICAO Convention

Attachment G to ICAO Annex 6 explains the purpose of the MEL, and its philosophy:

If deviations from the requirements of States in the certification of aircraft were not permitted an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations

Figure 1-2: Extract 2 from the ICAO convention

In the early 70's, and with the introduction of the A300B2, Airbus' first MMELs were already in accordance with the above-mentioned Convention and its regulations.

At that time, Airbus' MMELs were designed as follows:

AIRBUS  INDUSTRIE A 300 MASTER MINIMUM EQUIPMENT LIST		
52 - <u>DOORS</u>		
1- CARGO DOOR ACTUATOR	2	(m) Both may be inoperative provided : 1) The integrity of yellow hydraulic system is not affected 2) The door is manually latched in the close position

Figure 1-3: Extract of the A300 B2/B4 MMEL

Today, Airbus' MMELs look like this:

 A318/319/320/321 MASTER MINIMUM EQUIPMENT LIST		01-52 P 2	
DOORS		SEQ 002	REV 24
1. SYSTEM AND SEQUENCE NUMBERS	2. RECTIFICATION INTERVAL	3. NUMBER INSTALLED	
ITEM		4. NUMBER REQUIRED FOR DISPATCH	
		5. REMARKS OR EXCEPTIONS	
52-30 CARGO 30-01 Cargo door actuator R	C 4 2	a) One per door may be inoperative provided : 1) The integrity of yellow hydraulic system is not affected, and 2) Wind velocity does not exceed 30 kt, and 3) The operation of the door with a single actuator is limited to 10 open/close cycles, and 4) The Inspection Service Bulletin (ISB) 52-1070 has been successfully performed.	

Figure 1-4: Extract of the A320 MMEL

1.3. WHY AN MMEL?

Aircraft are designed with high reliability equipment and with system redundancies. The Type Certificate of an aircraft certifies the aircraft with all equipment in operative condition.



Nonetheless, failures can still occur, and flight delays or cancellations lead to high operating costs.

The primary objective of the MMEL is to, therefore, reconcile an **acceptable level of safety** with aircraft **profitability**, while operating an aircraft with inoperative equipment.



1.3.1. TO ENSURE A SAFE DISPATCH



The MMEL development is a process that involves many specialists within Airbus, such as MMEL specialists, system designers, safety specialists, etc.

For each MMEL item, specialists take into account the:

- Impact of the item's failure on the safety of the flight
- Results of flight and/or simulator tests
- Impact of the failure on crew workload
- Impact of multiple unserviceabilities
- Impact of the next critical failure.

The interaction between systems is extensively analyzed to ensure that multiple failures will not result in an unsatisfactory level of safety. In addition, the analysis not only considers the consequences of the item's failure, but also analyzes the consequences of the next critical failure (Refer to §2.2.2).

When an aircraft is dispatched by application of the MMEL/MEL, an acceptable level of safety is maintained by:

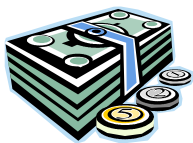
- The transfer of a function to another piece of equipment (redundancy), or
- The provision of required data by another piece of equipment (standby instruments), or
- The compliance with adequate limitations and/or procedures (flight crew and/or maintenance procedures).

The MMEL is a legal document, required for the dispatch of an aircraft. This document is also reviewed by the authorities prior to granting approval or acceptance.

As a result, the safe operation of an aircraft, with one or more pieces of inoperative equipment, is safely guaranteed by the MMEL/MEL.

For more information on the MMEL development process, please refer to §2.2.

1.3.2. TO INCREASE PROFITABILITY



The MMEL not only ensures the safe dispatch of an aircraft, but also contributes to ensuring that Operators obtain the maximum benefit from their Airbus fleet in their daily operations. The MMEL contributes to Operator profitability.

The first economical aspect is related to aircraft operation. The MMEL permits the operation of an aircraft with one or more pieces of equipment inoperative, when a failure is detected in flight or during ground servicing. The possibility to dispatch the aircraft prevents unscheduled maintenance, flight delays, or cancellations.

The second economical aspect of the MMEL is to optimize "initial provisioning" and, in this way, reduce storage costs.

The "initial provisioning" is a catalog listing of all the Line Replaceable Units (LRU), the corresponding number of spare parts, with their cost. This initial provisioning is based on a complex mathematical model that takes into account several factors, including the:

- Number of aircraft in the fleet
- Total number of flight hours per year
- Spare part unit price
- Quantity of items per aircraft...

This catalog enables Operators to order their spare parts several months in advance of aircraft delivery, in order to anticipate AOG situations.

One of the factors taken into account by the model is directly linked to the MMEL. This factor is referred to as the "Essentiality Code" (EC), and corresponds to the MMEL item attributes:

- EC=1: Corresponds to a "NO GO" item
- EC=2: Corresponds to a "GO IF" item
- EC=3: Corresponds to a "GO" item.

Examples:

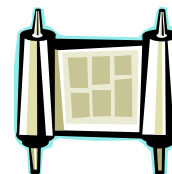
- *For a "NO GO" item, the corresponding spare parts should be available at each secondary base, in order to avoid flight delays or cancellations.*
- *For a "GO" or "GO IF" item, with its corresponding Rectification Interval, the applicable spare parts should be available at the home base. This organization enables Operators to plan the return of the aircraft to the home base. Consequently, the aircraft is able to continue its flight normally under MEL.*

The MMEL is, therefore, a major contributor to operational reliability, and may represent a way for Operators to significantly reduce operating costs.

1.4. MMEL/MEL LEGAL REQUIREMENTS

1.4.1. JAA POLICIES AND REGULATIONS

The legal policies and regulations for the creation of the Master Minimum Equipment List (MMEL) and the Minimum Equipment List (MEL) are provided in the Joint Aviation Regulations (JARs).



1.4.1.1. JAR-OPS 1.030

JAR-OPS 1.030 provides the basic rules that govern the MMEL and the MEL:

**JAR-OPS 1.030 Minimum Equipment Lists
- Operator's
Responsibilities**

a) An operator shall establish, for each aeroplane, a Minimum Equipment List (MEL) approved by the Authority. This shall be based upon, but no less restrictive than, the relevant Master Minimum Equipment List (MMEL) (if this exists) accepted by the Authority.

b) An Operator shall not operate an Aeroplane other than in accordance with the MMEL unless permitted by the Authority. Any such permission will in no circumstances permit operation outside the constraints of the MMEL

Figure 1-5: Extract of JAR OPS 1.030

The MMEL is an operational document, based on the JAR OPS-1, managed by the Airbus Flight Operations MMEL department, and examined by the operational divisions of the French DGAC and the JOEB/MMEL Subgroup of the JAA.

However, as mentioned in the ICAO Convention (Annex 6), the MMEL should also take into account applicable airworthiness requirements (JAR 25/FAR 25), to ensure that aircraft compliance with these requirements is not affected.

In this respect, the MMEL approval, or acceptance, process is linked to the certification process: **The MMEL is an approved deviation of the aircraft Type Certificate.**

Note: The MMEL is developed in parallel to the preparation of Type Certificate. However, the MMEL is not required for the issuance of the Type Certificate.

1.4.1.2. JAR-MMEL/MEL

JAR-MMEL/MEL provides the requirements for the creation and approval/acceptance of the MMEL and MEL.

All the JAR-MMEL/MEL references within this brochure are based on the 2005 issue.

The JAR-MMEL/MEL has two sections:

- Section 1: Requirements
 - Subpart A-General
 - Includes the requirements for applying the JAR-MMEL/MEL (applicable regulations, airworthiness directives, limitations of MEL applicability, etc.), and a glossary of terms and acronyms used in the document.
 - Subpart B (C respectively)-MMEL (MEL respectively)
 - Includes:
 - The definition of the MMEL (MEL respectively):
 - The applicable types of operations
 - The format and language to be used in the MMEL (MEL respectively)
 - All the required sections of the MMEL (reference to multiple unserviceabilities, Operational and Maintenance procedures, Rectification Intervals).
 - The conditions for approval.
- Section 2: Advisory Circular Joint (ACJ)
 - Provides explanations and interpretations of the requirements in Section 1.
 - An Operator that adopts following requirements published in the ACJ, can be confident in obtaining Authority approval.

Examples:

- **ACJ MMEL/MEL.065(b) Format of MEL** (See JAR MMEL/MEL.065)
 - 1 The ATA 100/2200 specification numbering system is preferred
 - 2 A proposed five-column format for the technical pages of all MELs is shown in Appendix 1 to ACJ-MMEL/MEL.025.
 - 3 Appendix 2 of ACJ-MMEL/MEL.065 can be used as a model for the preamble.
- **ACJ MMEL/MEL.030 Multiple Unserviceabilities** (See JAR MMEL/MEL.025)
 - 1 MMEL preamble should make it clear that not all combinations of unserviceabilities are considered.
 - 2 The MMEL cannot include all combinations of unserviceabilities. Therefore it has to be accepted that because of the variety of multiple unserviceabilities which could arise, it is likely that many of them will not be incorporated in the MMEL.

1.4.1.3. JAR-OPS 1 MEL POLICY DOCUMENT (TGL 26)

JAR 25 provides the **Airworthiness Standards** for the issuance and modification of Type Certificates. JAR-OPS 1, however, provides the requirements that are applicable to the **operation** of an aircraft.

JAR-OPS 1 is applicable to all JAA Operators that operate an aircraft for commercial air transportation.

Items specifically required in JAR-OPS 1, are generally not specified in the MMEL, because they depend on the operational regulations of the country in which the aircraft is registered. These items are listed "As required by regulations" in Airbus MMELs (Refer to §4.2.2.4).

However, it became evident that Operators and Authorities needed guidance for the development and approval of their MELs, in order to fully comply with the instruments and equipment requirements provided in the JAR-OPS 1.

Guidelines for "As required by regulations" items can be found in the "JAR-OPS 1 MEL Policy document". It is also called: Temporary Guidance Leaflet (TGL) N°26 (Section 4, Part 3 of the JAA Administrative & Guidance Material).

TGL 26 is, therefore, designed to:

- Help Operators create their MEL
- Ensure MEL standardization for various JAA Operators
- Help Authorities in the MEL evaluation and approval process.

Therefore, Operators that follow JAR-OPS rules may find most of the dispatch requirements, for the "As required by regulations" items, in the TGL 26 (Refer to §4.2.2.4).

Non-JAA Operators can also follow the TGL 26 guidelines.

1.4.1.4. MMEL PROCEDURES MANUAL

The MMEL Procedures Manual, is issued by the JAA, and provides guidelines on the creation and approval/acceptance of the MMEL.

The MMEL Procedures Manual provides a centralized source of guidance information to facilitate the review of JAA MMELs and MELs.

Note: All the above-mentioned texts can be consulted on the following website:
<http://www.jaa.nl>

1.4.2. FAA POLICIES AND REGULATIONS

In the JAA model: The aircraft manufacturer writes the MMELs. These MMELs are endorsed and recommended by the JAA for approval by the National Authorities.

In the FAA model: **The FAA writes and approves the MMELs.**

A comparison between the JAA and FAA MMEL approval process is provided in §3.3.3.3.

1.4.2.1. FAR 121.628

FAR 121.628 is the legal document used by the US FAA to create and approve FAA MMELs.

§ 121.628 Inoperable instruments and equipment.

(a) No person may take off an airplane with inoperable instruments or equipment installed unless the following conditions are met:

- (1) An approved **Minimum Equipment List** exists for that airplane.
- (2) The certificate-holding district office has issued the certificate holder operations specifications authorizing operations in accordance with an approved Minimum Equipment List. The flight crew shall have direct access at all times prior to flight to all of the information contained in the approved Minimum Equipment List through printed or other means approved by the Administrator in the certificate holders operations specifications. An approved Minimum Equipment List, as authorized by the operations specifications, constitutes an approved change to the type design without requiring re-certification.

Figure 1-6: Extract of FAR 121.628 extract

The above-mentioned requirements are repeated in FAR 125.201, FAR 129.14, and FAR 135.179, depending on the FAR under which the Operator is certificated.

1.4.2.2. POLICY LETTERS

Policy Letters are guidelines for the MMEL approval process, and for the use of the MEL. These Policy Letters are designed to help achieve standardized dispatch conditions for all aircraft types at the FAA MMEL/MEL level.

Note: All Policy Letters can be consulted on the following website:
<http://www.opspecs.com>

1.4.2.3. MEL HANDBOOK

The FAA “**Air Transportation Operations Inspector’s Handbook 8400.10**”, Volume 4, Chapter 4, deals in particular with the creation of the MMEL, the MMEL approved process, and the Configuration Deviation List (CDL).

CHAPTER 4. MINIMUM EQUIPMENT LISTS (MEL) AND CONFIGURATION DEVIATION LISTS (CDL)	
Section 1. General.....	4-561
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Section 3. MEL Approval Process.....	4-589
Section 4. MEL use in service.....	4-609
Section 5. Master Minimum Equipment List subsystem (MMEL subsystem).....	4-623
Section 6. Configuration Deviation List (CDL).....	4-637

Figure 1-7: Table of Contents of the MEL Handbook

1.4.2.4. FAR OPERATING RULES

Relevant FAR operating rules may be used to specify the “As required by FAR” items in the FAA MMELs.

FAR Operating rules extracts	
FAR 23	Airworthiness Standards: Normal, utility, acrobatic, and commuter category airplane
FAR 25	Airworthiness Standards: Transport Category Airplane
FAR 33	Airworthiness Standards: Aircraft Engines
FAR 91	General Operating and Flight Rules
FAR 121	Operating Requirements: Domestic, Flag, and Supplemental Operations
FAR 125	Certification and Operations: Airplanes having a seating capacity of 20 or more passengers, or a maximum payload capacity of 6000 pounds (2.7 tons), or more.
FAR 129	Operations: Foreign air carriers and foreign operators of US registered A/C engaged in common carriage.
FAR 135	Operating Requirements: Commuter and On-demand Operations and rules governing persons on-board such aircraft.

Figure 1-8: Applicable FAR Operating Rules

1.4.3. AIRWORTHINESS DIRECTIVES (ADS)

After the occurrence of an in-service event, Airworthiness Authorities may require specific actions to be taken. Such actions are published in Airworthiness Directives (ADs).

When applicable, an AD may require that the affected MMELs/MELs be updated, as indicated by the "Mandatory actions and compliance times" paragraph of the AD.

The rule to keep in mind in the above-mentioned case is that **an AD always supersedes any published MMEL/MEL dispatch requirement**. As soon as an AD requires an MMEL modification, Airbus usually issues an MMEL Temporary Revision.

The reference of the MMEL Temporary Revision is provided in the REFERENCE PUBLICATION section of the AD. However, this Temporary Revision may later be reissued or incorporated into an MMEL general revision, even if not required by an AD.

Therefore, the new issue of this MMEL Temporary Revision, or the MMEL general revision, is still compliant with the AD.

As a general rule, the MMEL/MEL restrictions established in an AD remain valid until the corrective actions, indicated in the AD, have been applied.

Please, keep in mind...

MMEL/MEL General Presentation

The objective of the MMEL is to ensure:

- An acceptable level of safety, while operating an aircraft with inoperative equipment
- Aircraft profitability by avoiding Aircraft On Ground (AOG) situations.



MMEL/MEL Legal Bases

The applicable documents that serve as the reference for the creation of the MMEL and the MEL are provided by either Joint Aviation Authorities (JAA) or Federal Aviation Administration (FAA) documents.

These documents are:



Airworthiness Directives (ADs), published as a result of an in-flight event, always supersede any published MMEL/MEL dispatch requirement.



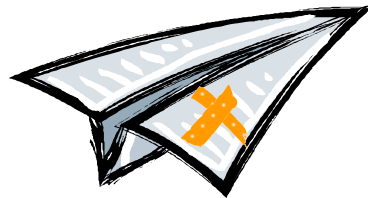
2. MMEL DEVELOPMENT PROCESS

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2.1. INTRODUCTION

An aircraft is type-certified with all of its required equipment operative. If deviations were not permitted either from this type-certified configuration, and/or from the equipment required by the operating rules, the aircraft could not be flown in revenue services unless such equipment is operative.



Aircraft operation has proven that, in specific conditions, and for a limited period of time, it is not necessary for every aircraft system or component to be operative, provided that the remaining operative instruments and equipment ensure an acceptable level of safety. Therefore, some conditional deviations from the Type Certificate requirements are authorized, in order to permit uninterrupted operation of the aircraft in revenue flight. These conditional deviations are referred to as "**dispatch conditions**", and are published in the MMEL.

When an aircraft is dispatched by application of the MMEL, operational and safety integrity of the aircraft is maintained. **The MMEL aims at ensuring safe and normal operation of the aircraft, even if some items are inoperative.** The MMEL does not grant the possibility to depart with a system inoperative, if the system failure impairs the aircraft operation, or the safety of the flight.

Due to the fact that the main purpose of the MMEL is to enable an aircraft to be dispatched for a limited period of time, Rectification Intervals have also been defined and incorporated in the Airbus MMEL.

In addition, Airbus has introduced the "failure classification" concept, in order to help Operators distinguish between the different failures, and to determine the appropriate flight crew or maintenance actions.

This section is designed to first provide insight into the justification methods, adopted by Airbus in the MMEL development process. It will then address the Rectification Interval and the "Failure Classification" concept.

2.2. DEVELOPMENT PRINCIPLES TO JUSTIFY DISPATCH CONDITIONS

The MMEL is the result of comprehensive research and analysis, including the review of numerous operational conditions and factors, for the purpose of ensuring the safe dispatch and normal operation of an aircraft for each MMEL item.

Before proposing a new MMEL item to Airworthiness Authorities (Refer to §3.3.3), Airbus must be able to substantiate that, even if the specific system is inoperative, it is still possible for the aircraft to **maintain an acceptable level of safety as intended by the applicable regulation**.

A **qualitative analysis** and, if necessary, a **quantitative analysis** is systematically done, in order to achieve this objective. **These analyses not only take into account the consequences of the item failure, but also the consequences of the next critical failure that could occur in flight.**

2.2.1. QUALITATIVE ANALYSIS: CONSEQUENCES OF THE FAILURE

A **qualitative analysis of the consequences of a failure** is performed first, and takes all aspects of aircraft operation into account. This analysis focuses on:

- The transfer of a function to an alternate operating component

Example:

On A320 aircraft, if the Bleed Control System 1 (associated with Engine 1) is inoperative, the Bleed Control System 2 completely takes over this function for both engines.

- The reference to other systems that perform the required function, or provide the required information

Example:

A system failure is monitored by the ECAM E/WD and is indicated by a FAULT light. Consequently, if the fault light fails, the system monitoring is still ensured by the ECAM E/WD.

- The adjustment of operational limitations

Example:

If the aircraft is dispatched with one brake inoperative, performance penalties must be applied, in order to adapt the operation of the aircraft to the actual aircraft braking capability.

- The adjustment of flight crew and/or maintenance procedures

Example:

If the pressure indicator on the slide bottle is inoperative, it is necessary to check the pressure of the slide bottle before the first flight of each day.

- The minimal adjustment to the flight crew's workload

Example:

On A340 aircraft, if the fuel temperature indicator on the outer tank is inoperative, the flight crew is requested to monitor the Total Air Temperature (TAT) during the entire flight.

A qualitative analysis is based on engineering judgment. This analysis may be based on the experience achieved from previous MMEL relief.

A qualitative analysis for the same item, on another aircraft type, is not directly applicable. A qualitative analyses have to take into account the differences in the architecture, and operational use, of the aircraft systems.

Flight and simulator tests can be a useful tool to evaluate the complexity of maintenance, and/or flight crew procedures, if an item is inoperative, and can help to evaluate the impact that an inoperative item may have on flight crew workload. The interactions between systems are fully analyzed to ensure that multiple failures do not result in an unsatisfactory level of safety.

The purpose of the qualitative analysis is to determine that **the failure of a candidate* system has no more than Minor** consequences** on the safety of the flight. Appropriate additional dispatch conditions, such as operational restrictions, flight crew procedures, or maintenance procedures, can be taken into account, in order to achieve this objective.

* A candidate system is a system that is likely to be included into the MMEL

** The standard definitions of failure effects classification are provided in Appendix 6.3 of this document

Example: Failure of an engine starter valve on A300-600 aircraft.

The air turbine starter is used to start the engine with the bleed from the APU:

- *If the starter valve is in the open position, this will enable the APU bleed to go through a turbine that will start the engine*
- *If the starter valve is in the closed position, this will prevent hot bleed from the APU to enter the engine.*

Qualitative analysis has demonstrated that it is possible to safely fly the aircraft by securing the starter valve in the closed position:

- *The failure of the starter valve in the closed position has no effect on the safety of the flight. However, on ground, the flight crew should start the engine manually*
- *The failure of the starter valve in the open position could lead to an air turbine starter failure (because the turbine freely rotates with excess speed), and this may have an effect on the safety of the flight.*

Based on the above qualitative analysis of an engine starter valve failure, the MMEL addresses the starter valve item, and provides a corresponding flight crew and/or maintenance procedure to be applied in the case of a failure. These procedures explain how to manually start the engine on ground, and how to securely close the starter valve for the flight.

2.2.2. QUALITATIVE ANALYSIS: CONSEQUENCES OF THE NEXT CRITICAL FAILURE

When it is demonstrated that the consequences of a system failure are no more than **Minor**, the next step is to perform a **qualitative analysis of the next critical failure in flight**.



A failure will be labeled as the “next critical failure” when its consequences, in combination with the specific failure, have the most adverse effect on aircraft operations.

An analysis similar to the one described above (Refer to §2.2.1), is performed to demonstrate that the flight can be safely continued in acceptable conditions, even if an additional failure occurs during the flight.

Example:

The Fuel Engine LP Valve is “NO GO” because:

- *If the valve fails in the closed position, it is not possible to start the engine.*
- *If the valve fails in the open position, it is not possible to isolate the affected engine in the case of an engine fire.*

Therefore, the purpose of a qualitative analysis is to determine that **the next critical failure** after the failure of the MMEL candidate system **has no critical consequences** on the safety of the flight.

Dispatch conditions, such as operational restrictions, flight crew procedures, or maintenance procedures, can be taken into account to achieve this objective.

2.2.3. QUANTITATIVE ANALYSIS: COMPLIANCE WITH SSA

The certification process of an aircraft demonstrates compliance of the aircraft design with the safety objectives mandated by applicable regulations. In order to assess this compliance, Airbus must estimate the consequences of aircraft failures.

As part of this certification process, **System Safety Assessments (SSA)** are performed to demonstrate aircraft compliance with applicable regulations.

An SSA is a systematic evaluation of the system that identifies the failure conditions to show that the safety objectives are met.

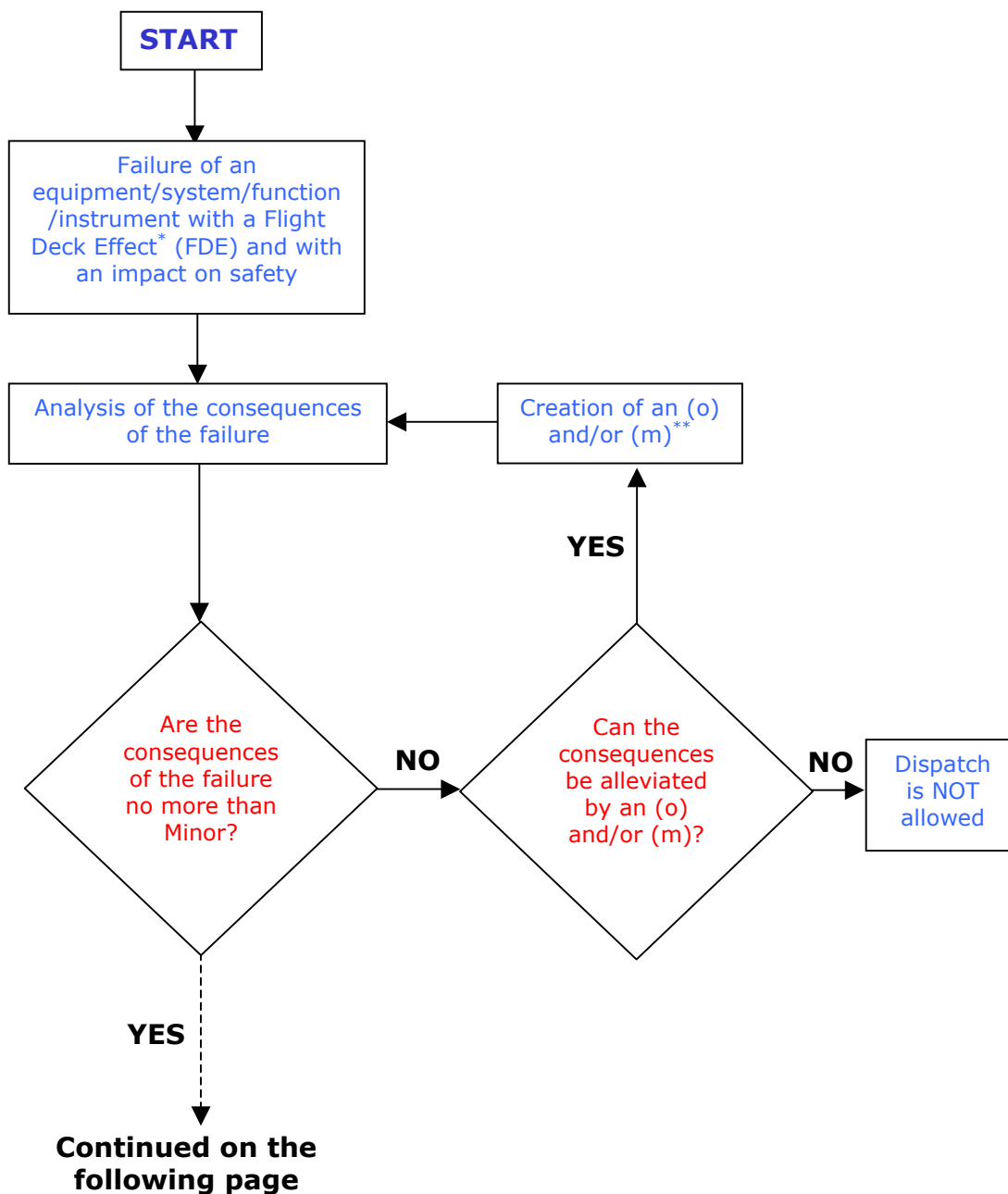
As part of the MMEL evaluation process, when the previous described qualitative analyses have been performed, an additional **quantitative analysis** may be completed.

This quantitative analysis consists in reviewing all **SSA** that involve the considered system.

These analyses are performed to demonstrate that, even with a failed item, **safety objectives are still met** and that the aircraft can still be safely operated.

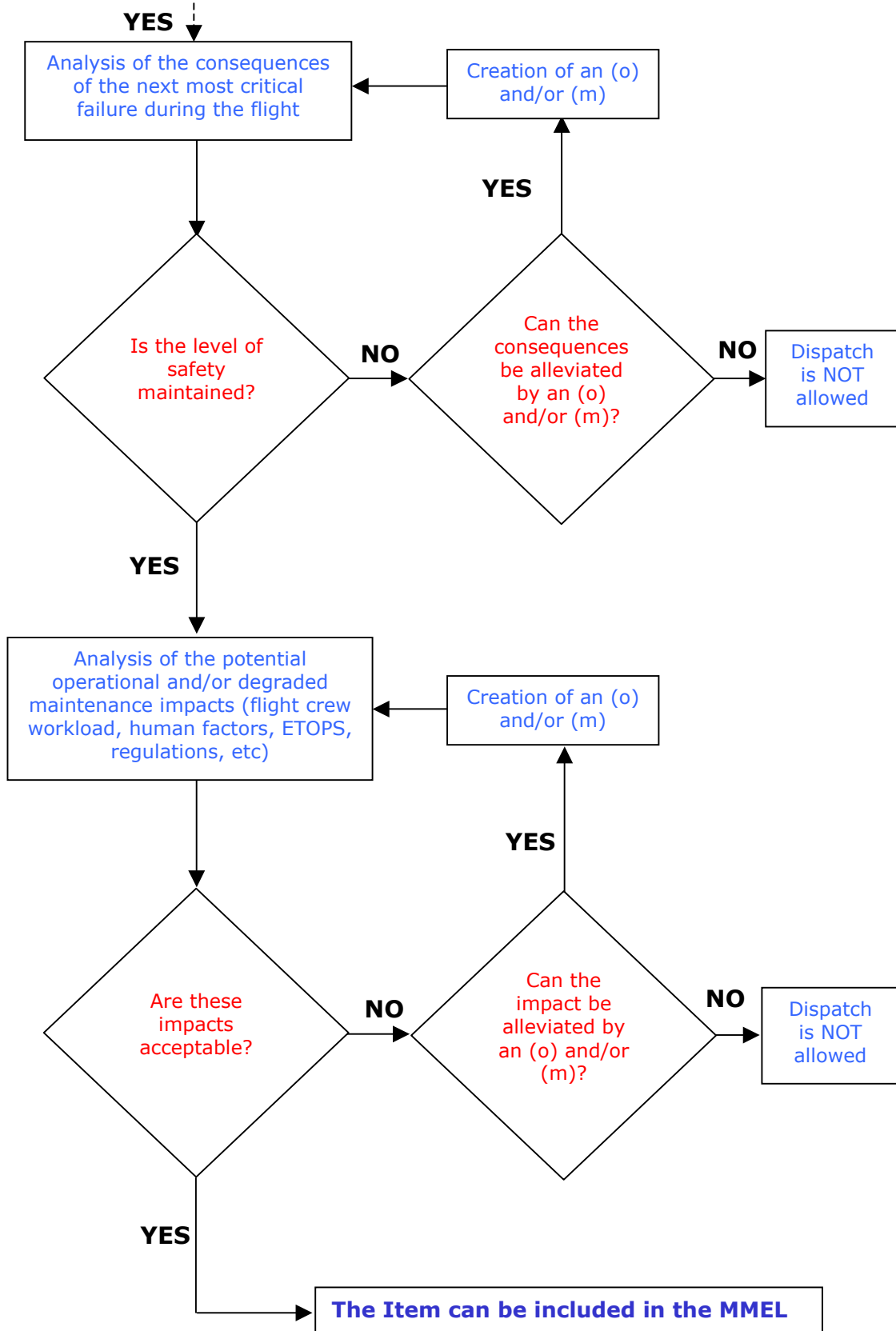
2.2.4. SUMMARY OF THE ANALYSIS PROCESS

The following diagram summarizes the various steps that are involved in the MMEL development process:



* A Flight Deck Effect (FDE) is any event that may be identified by the flight crew when in the flight deck (Refer to §4.4.2.1)

** (o) refers to flight crew procedures indicated in Section 01 of the MMEL
(m) refers to maintenance procedures indicated in Section 01 of the MMEL

Continued from previous page

2.3. MMEL RECTIFICATION INTERVALS

2.3.1. RECTIFICATION INTERVAL DEFINITION

The MMEL limits the period of time that an aircraft can be operated with inoperative items. These limits are defined to:

- Maintain an acceptable level of safety
- Prevent degraded maintenance
- Prevent multiple failures that may accumulate over time and, therefore, penalize safety and aircraft operations.



As specified in the Preamble of the MMEL, inoperative items should be repaired as soon as possible, and within the period of time defined by the **Rectification Intervals**.

Aviation Authorities required that Rectification Intervals be introduced in all Airbus MMELs. The following table indicates when these Rectification Intervals were introduced in the Airbus MMEL of each aircraft type:

	Aircraft Type	Revision Number	Revision Date
A300/A310	A300 B2/B4	REV 20	September 2000
	A300FFCC	REV 09	September 2000
	A310	REV 12	March 2000
	A300-600	REV 10	March 2000
A320	A319/A320/A321	REV 22	July 1998
A330/A340	A330	REV 11	June 2000
	A340	REV 12	June 2000

In accordance with the definition provided in JAR-MMEL/MEL.040, the following four Rectification Intervals (A, B, C, and D) have been introduced in Airbus MMELs:

Rectification Interval	A	B	C	D
Consecutive Calendar Days (excluding the day of discovery*)	**	3	10	120

* Not applicable to 'A' Rectification Intervals that specify a limited number of flights or flight hours. In this case, the 'A' Rectification Interval countdown starts from the first flight that follows the discovery of the failure.

** Category A does not specify a standard Rectification Interval. However, items in this category shall be rectified in accordance with the time limitation defined in the dispatch conditions of this item in MMEL section 01.

The inoperative item must be fixed prior to the expiration of the associated Rectification Interval. The countdown to the Rectification Interval excludes the day of discovery of the failure.

Example: If the failure is discovered at 10 a.m. on January 26th, the Rectification Interval will begin at midnight during the night of January 26th to January 27th.

However the MMEL dispatch conditions, that include any associated flight crew (o) and/or maintenance (m) procedures, must be applied from the very first flight that follows the discovery of the failure.



2.3.2. RECTIFICATION INTERVAL ATTRIBUTION TO MMEL ITEMS

The 'C' Rectification Interval corresponds to the maximum period of time that the Authorities will accept before repairing a basic/standard aircraft system. After the safety analysis of the system failure, it may be necessary to attribute the shorter, 'B' Rectification Interval.

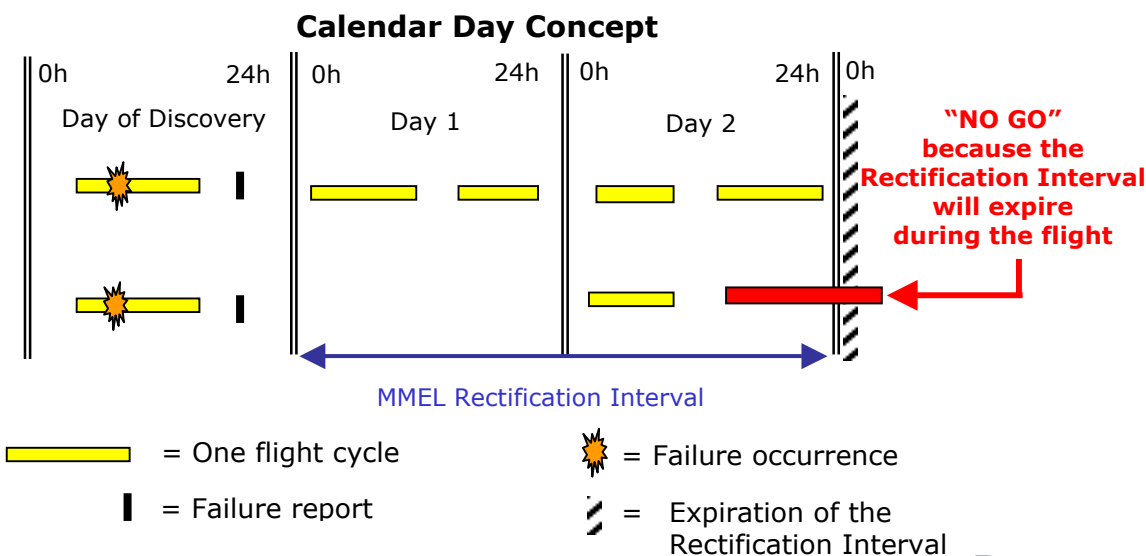
Most of the optional systems on an aircraft are attributed a 'D' Rectification Interval.

An 'A' Rectification Interval is used to take into account specific items that cannot be classified 'B', 'C', or 'D'. The duration of an 'A' Rectification Interval may be shorter or longer than the 'B', 'C', or 'D' Rectification Intervals.

Calendar Day/Flight Day:

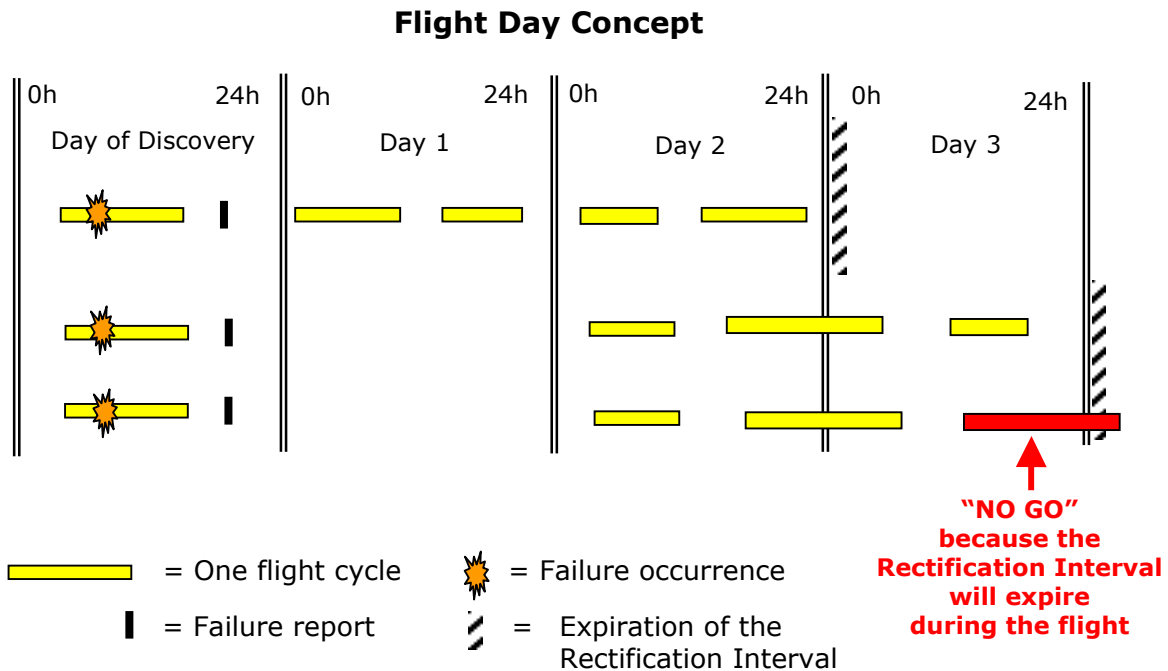
- The JAA and the FAA both use the "**calendar day**" concept: A calendar day is a 24-hour period from midnight to midnight either in Coordinated Universal Time (UTC), or in local time, as decided by the Operator. The 'B', 'C' and 'D' Rectification Intervals are expressed in "**consecutive calendar days**". An 'A' Rectification Interval is also expressed in consecutive calendar days, unless the dispatch conditions specify a limited number of flights, flight hours, or flight days.

Example: It is acceptable for the applicable item to be inoperative for two calendar days ('A' Rectification Interval).



- Some 'A' Rectification Intervals may use the "**flight day**" concept: A flight day is a 24-hour period from midnight to midnight either in UTC, or local time, as decided by the Operator, during which the aircraft flies at least one time. Therefore two flight days might not be consecutive calendar days.

Example: It is acceptable for the specific item to be inoperative for two flight days ('A' Rectification Interval)



Dispatch of the aircraft is not permitted when the Rectification Interval specified in the MEL, has expired, unless the Rectification Interval is extended in accordance with a specific procedure provided in the JAR-MMEL/MEL, and described in the following paragraph (§2.3.3).

2.3.3. RECTIFICATION INTERVAL EXTENSION



Aircraft dispatch is not permitted if the Rectification Interval has expired. However, in accordance with the JAR-MMEL/MEL.081, Operators may be granted **a one-time extension** of the applicable Rectification Interval 'B', 'C', or 'D'. The Rectification Interval Extension (RIE) is not applicable to 'A' Rectification Intervals.

The JAR-MMEL/MEL.081 describes the one-time extension of Rectification Interval, and provides the requirements for its authorization for Operators:

Subject to the approval of the Authority, 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, provided:

- a) A description of specific duties and responsibilities for controlling extensions is established by the operator and accepted by the Authority, and
- b) The operator only grants a one time extension of the applicable Rectification Interval, and
- c) The Authority is notified of any extension granted within a timescale acceptable to the Authority, not to exceed one month, and
- d) Rectification is accomplished at the earliest opportunity.

Figure 2-1: JAR-MMEL/MEL.081

In exceptional circumstances, the Operators may directly negotiate, with their National Authorities, for a second extension of the Rectification Interval. This permission for a second extension is granted only by the National Authorities, and does not involve Airbus.



Note: What is the difference between a 10-day 'A' Rectification Interval and a 'C' Rectification Interval?
In both cases, the item must be rectified within 10 days. However, the difference is that **a one-time extension is not possible for an 'A' Rectification Interval.**

2.4. FAILURE CLASSIFICATION

At the initial design stage of an aircraft, each potential failure is identified and classified. The potential operational/maintenance consequences of the failure (and its impact on safety) are analyzed, taking into consideration the failure as a single failure, or as a failure combined with one or more failures.

At the aircraft level, failures are handled by:



- The maintenance panel for the A300/A310 family.

- The Centralized Fault Display System (CFDS) for the A320 family.

- The Central Maintenance System (CMS), for the A330/A340.



For the A320 family and A330/A340, the CFDS or the CMS centralize information about a faulty system and classify the failure as a class I, II, or III failure, depending on its operational and maintenance impact:

- Failures that result in an operational event in the cockpit are class I failures
- Failures that trigger an ECAM MAINTENANCE STATUS are class II failures
- Failures that do not result in an operational event in the cockpit, or that do not trigger an ECAM MAINTENANCE STATUS are class III failures.

With this failure classification of class I, II, or III, any items listed in the A320/A330/A340 MMELs may be given a "GO", "GO IF", or "NO GO" status.

This failure classification does not exist for the A300/A310 family.

Note: Authorities do not require this failure classification. It has been developed by Airbus, in order to help to distinguish between the different failures and to define appropriate flight crew or maintenance indications.

The notion of "failure classification" is not directly related to the notion of "failure effect", as detailed in Appendix 6.3.

2.4.1. CLASS I FAILURES

Class I failures have operational consequences and may affect the dispatch of the aircraft. Therefore, **all class I failures are either listed in the MMEL or are "NO GO"**.

Operators must refer to the MMEL to determine if a specific class I failure is "GO", "GO IF", or "NO GO".

The occurrence of a class I failure is automatically displayed to the flight crew by either:

- A warning or a caution on the overhead panel and/or on the windshield.
- A message(s) on the ECAM display unit
- Flag/loss of indication on the Primary Flight Display (PFD), Navigation Display (ND), System Display (SD), and/or Engine/Warning Display (E/WD)
- An indication in the flight deck and/or in the cabin.

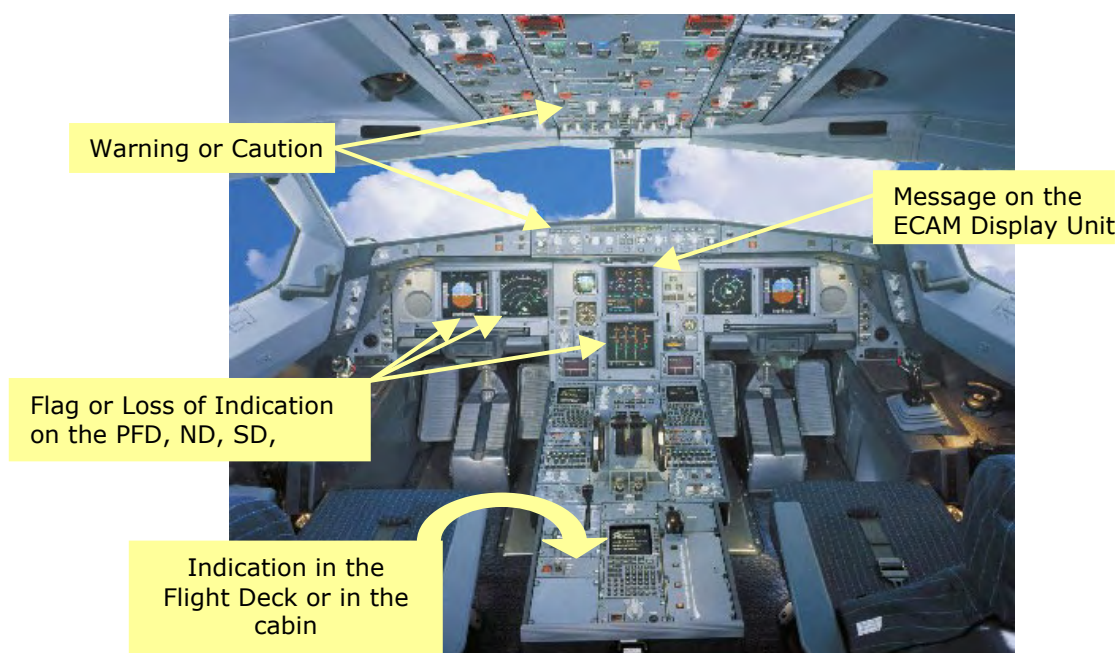


Figure 2-2: Cockpit Effects

2.4.2. CLASS II FAILURES

Class II failures:

- Do not have operational consequences
- Are indicated to the flight crew by a MAINTENANCE message on the ECAM STATUS page.

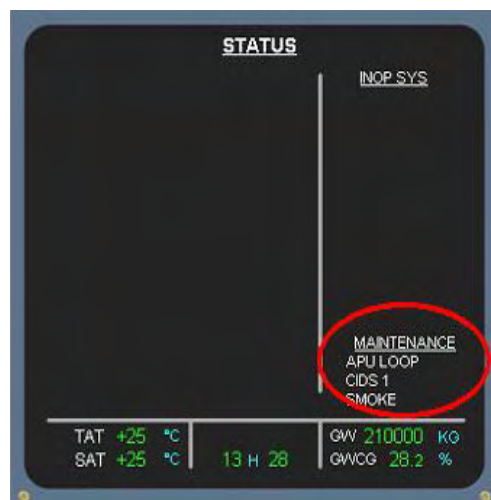


Figure 2-3: Class II Failure on the ECAM STATUS Page

Note: MAINTENANCE messages are only displayed when the aircraft is on ground, and appear before engine start-up (Phase 1), or after engine shutdown (Phase 10).

Class II failures are maintenance-related failures.

Based on safety analyses, Airbus demonstrated that all class II faults could remain un-rectified for a:

- **'C' Rectification Interval for the A320 family**
- **Maximum of 600 flight hours, or until the next A-check as mentioned in the introduction of the A330/A340 Troubleshooting Manual (TSM).**



For the A320 family, all class II failures (MAINTENANCE messages) are addressed in the MMEL. The MMEL lists the corresponding items at the beginning of each ATA chapter. All class II failures, except two*, are "GO" without condition for a 'C' or a 'D' Rectification Interval. Operators should refer to the MMEL, in order to determine if a specific class II failure is "GO", "GO IF", or "NO GO".

Example: MMEL Item 21-00-01

21-00 MAINTENANCE MESSAGE DISPLAYED ON ECAM STATUS PAGE					Dispatch with this <u>MAINTENANCE</u> message displayed on ECAM <u>STATUS</u> page is granted.
00-01 PACK	C				

*** For the A320 family, the class II messages are "GO" without condition, except for the following two MAINTENANCE messages:**

- **BLUE RSVR:** This class II message is "NO GO" (Refer to MMEL Item 29-00-01) for aircraft not fitted with MOD 23119: Hydraulic power-Blue main hydraulic power-improve maintenance. Status of blue hydraulic reservoir.

00-01 BLUE RSVR	C				Dispatch with this <u>MAINTENANCE</u> message displayed on ECAM <u>STATUS</u> page is <u>not allowed</u> .
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- **AIR BLEED:** This class II message is "GO IF" (Refer to MMEL Item 36-00-01).

00-01 AIR BLEED	C				Dispatch with this <u>MAINTENANCE</u> message displayed on ECAM <u>STATUS</u> page is granted provided ENG BLEED pb sw are selected OFF for takeoff with APU bleed supplying the air conditioning packs.
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**For the A330/A340 family, all class II failures are:**

- **“GO” without condition**
- **Not listed in the MMEL. Operators can depart with one or more class II failures and do not have to refer to the MMEL.**

Class II failures must be rectified in accordance with the TSM. Therefore, it is permitted to fly with un-rectified class II failures until the next 'A' check. All class II failures should be rectified during 'A' checks. However, they can remain un-rectified between two 'A' checks.

Section 00 of the MMEL reminds that the handling of ECAM MAINTENANCE messages is addressed in the TSM.

HANDLING OF ECAM MAINTENANCE STATUS

MAINTENANCE messages displayed on ECAM STATUS page are for maintenance purpose only.

Dispatch with MAINTENANCE messages displayed on ECAM STATUS page is allowed without condition.

Management of these messages is handled by the Trouble Shooting Manual (TSM) and should be rectified within the timescale defined in the TSM.

2.4.3. CLASS III FAILURES

Class III failures:

- Do not have operational consequences
- Are **not listed in the MMEL**
- Are not indicated to the flight crew
- Are “GO” without condition.
- Can remain un-rectified for an unlimited period of time, and can be repaired at Operator's convenience

Operators can depart with one or more class III failures, and do not have to refer to the MMEL/MEL.

2.4.4. SUMMARY OF FAILURE CLASSES AND CONSEQUENCES

Failure/Fault classes	Class I	Class II	Class III
Operational Consequences	YES	NO	NO
Indication to the Flight Crew	YES	YES	NO
	Automatically displayed with a direct cockpit effect	Available on ECAM <u>STATUS</u> page	
Dispatch Consequences	YES Refer to the MMEL	NO	NO
	May be: "GO" "GO IF" "NO GO"	"GO" without condition Repair must be made: • Within timescale (600 Flight Hours) defined in TSM introduction for the A330/A340 • Within 10 days for the A320 Exceptions for A320: • BLUE RSVR • AIR BLEED	MMEL not applicable No fix time quoted for corrections: Handling left at Operator convenience
Indication to the Maintenance Team	Printout automatically at the end of the flight: • CFDS (A320) • CMS (A330/A340) Post-flight Report		Consultation on request via the CFDS/CMS Class III report

Please, keep in mind...

Development Principles to Justify Dispatch Conditions

Before proposing a new MMEL item to Airworthiness Authorities, the Airbus Flight Operations MMEL Department and safety specialists must substantiate the ability to **maintain an “acceptable level of safety” as required by an applicable regulation**, even if a specific system is inoperative.

Rectification Intervals

To maintain this “acceptable level of safety”, and to prevent degraded maintenance, the MMEL establishes limitations on the amount of time that an aircraft can be operated with inoperative items.

Rectification Intervals	A	B	C	D
Consecutive Calendar Days (excluding the day of discovery)	No standard Rectification Interval (refer to dispatch conditions)	3	10	120

Rectification Intervals B, C, and D may be extended one time.

Failure Classification

For the A320 and the A330/A340 families, the Central Maintenance System (CMS) or the Centralized Fault Display System (CFDS) centralize the failures, and classify them, based on their effect on safety and in the cockpit. Only Class I failures may prevent aircraft dispatch and are addressed in the MMEL.