



Electrical Wiring in Relation to the MMEL

The MMEL

- The MMEL is a master list appropriate to an aircraft type which determines those instruments, items of equipment or system functions that, while maintaining the level of safety intended by the applicable certification basis, may temporarily be inoperative either due to the inherent redundancy of the design, and/or due to specified operational and maintenance procedures, conditions and limitations, and in accordance with the applicable procedures for Continued Airworthiness (JAR MMEL/MEL 1 May 2000)

The MMEL

- Concept of the MMEL recognises that:
 - ❖ flight(s) can be performed safely with certain inoperative equipment, under certain circumstances
 - ❖ strict compliance with TC equipment requirements is not always necessary to meet the TC level of safety
- "Inoperative" means that the item, component or system malfunctions to the extent that it does not accomplish its intended purpose or is not consistently functioning within its design operating limits or tolerances.

The MMEL

- The MMEL should specify:
 - ❖ Suitable limitations in the form of repair intervals, maintenance procedures, or crew operating procedures
 - ❖ Other restrictions as necessary to ensure an acceptable level of safety
- The MMEL must not:
 - ❖ Conflict with approved limitations, mandatory maintenance procedures, or ADs

The MEL

- The MMEL is applicable to an aircraft type and is developed in cooperation with the TC holder
- The MEL can be applicable to an operator's individual aircraft and its particular operation
- An MEL may be established by an operator - usually based upon the MMEL (if one exists)
- The MEL is intended to permit operation for a limited period of time until repairs can be accomplished

MMEL/MEL Observations

- MMEL/MEL provisions focus on safe operation with equipment not functioning
- No obvious division between dispatch with:
 - ❖ Equipment removed
 - ❖ Equipment failed
 - ❖ Equipment malfunctioning intermittently
- No obvious consideration of the mode of failure
- Removal of power not always specified

MMEL/MEL Wiring Concerns

- Example 1:
 - ❖ Narrow body twin jet, RH FQIS failure
 - ❖ Initial troubleshooting found wiring fault in a loom at the wing-to-body feed through
 - ❖ Dispatched for 10 days without repair to allow subsequent loom replacement

MMEL – Example 1

28 FUEL	R.I.	N.I.	N.R.	REMARKS OR EXCEPTIONS
1. Flight Deck FQI (Main Tanks)	C	2	1	One may be inoperative provided: (a) All boost pumps in associated tank operate normally (b) Fuel flow meters operate normally (c) Centre tank indicator operates normally (d) Flight crew periodically computes fuel remaining (e) Fuel quantity is verified by an acceptable procedure

MMEL/MEL Wiring Concerns

- Example 2:
 - ❖ Wide body twin jet, hydraulic indication failure
 - ❖ Initial troubleshooting found wiring fault in a loom in the wing-to-body area
 - ❖ Dispatched for 10 days without repair to allow planning for 4 day down time

MMEL – Example 2

29 HYDRAULIC POWER	R.I.	N.I.	N.R.	REMARKS OR EXCEPTIONS
2. Right Low SYS PRESS light	C	1	0	May be inoperative provided pump low PRESS lights and all HYD PRESS indications in the right system operate normally

MMEL/MEL Wiring Concerns - Summary

- MMEL entries target safe dispatch with instruments or equipment inoperative
- No requirement to consider the mode of failure when considering MEL dispatch
- Wiring faults can have inherent risks beyond the loss of equipment function
- In some cases dispatch occurs with known or suspect wiring defects and with power still applied

Conclusion

- Should dispatch with a known wiring fault be deemed to be outside the normal MEL dispatch allowance?
- Should the MMEL/MEL requirements be modified to clarify this point?
- Should ATSRAC recommend FAA to consider this issue further?