

How to manage aircraft systems failures that occur during taxi?

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Purpose of this Article:

The purpose of this article is to provide some guidelines about the management of failures that occur on ground during taxi when the aircraft moves under its own power. This article is particularly focused on MEL handling in the case of failure between start of taxi and start of takeoff roll.

✚ Flight Operations and Training

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Applicability:

All Airbus aircraft

Regulatory Basis:

EASA and FAA require Operators to define procedures in their MEL for the management of failure that occurs during the taxi-out phase.

For Operators under EASA regulations, the EASA Acceptable Means of Compliance (AMC) to part ORO.MLR.105(d)(3) defines the following rule that applies for MEL handling before takeoff:

AMC2 ORO.MLR.105(d)(3) Minimum equipment list

EXTENT OF THE MEL

The operator should include guidance in the MEL on how to deal with any failures that occur between the commencement of the flight and the start of the take-off. If a failure occurs between the commencement of the flight and the start of the take-off, any decision to continue the flight should be subject to pilot judgement and good airmanship. The pilot-in-command/commander may refer to the MEL before any decision to continue the flight is taken.

Note: In the EASA regulations, the commencement of the flight is defined as the moment when the aircraft starts to move under its own power for the purpose of takeoff (i.e. the taxi phase).

Therefore, the EASA regulations require that Operators to define an appropriate guidance for the management of the operational consequences in the case of failure between start of taxi and start of takeoff roll.

The EASA regulations also determine that the decision of the pilot should be based on their good judgment and airmanship.

Finally, the EASA regulations provide the pilot with the option to consult the MEL to assist the process to make a decision.

For Operators that comply with FAA regulations, the FAA regulations require that Operators establish a communication means between the Pilot In Command (PIC) and the aircraft dispatch organization and to apply the MEL when a failure occurs before takeoff.

Refer to the following summary of FAA order 8900.1 - Volume 4 - Chapter 4 - Configuration Deviation List (CDL) and Minimum equipment List (MEL)

E. Item Failures that Occur After an Aircraft Departs the Gate or Ramp Area, During Push-Back, Taxi, or Prior to Takeoff. POIs must ensure that each operator's MEL management program includes procedures for the PIC to communicate with the aircraft dispatcher or person authorized to exercise operational control (supplemental operations) and the maintenance organization to review the situation and determine which of the following actions is required:

1) Return for Repairs. If an inoperative item is not included in the MEL, or the inoperative item could affect the safety of flight due to circumstances such as weather and hazards en route, performance, W&B, or fuel limitations, the aircraft must return to the gate or ramp area for repairs.

2) Return to Accomplish (M) and (O) Procedures. PICs, dispatchers, or persons authorized to exercise operational control may determine that an inoperative item may be deferred and the appropriate (M) and/or (O) procedures accomplished in accordance with the operator's approved MEL and MEL management program.

3) Flightcrew Accomplishment of Certain MEL Procedures. POIs may approve procedures that permit flightcrew members to accomplish certain MEL deferrals in coordination with the operator's dispatch and maintenance organization, without returning to the gate or ramp area. These procedures must be part of the operator's FAA-approved MEL management program.

Therefore, for the FAA, the MMEL remains the reference material for decision making for dispatch in the case of failure after start of taxi and before takeoff roll.

Other National Aviation Authorities (NAA) developed their regulation that may be different to the EASA/FAA regulations. It is the responsibility of each Operator to individually check the applicable regulations.

Management of Aircraft System Failure During Taxi

As per Airbus policy for the management of ECAM procedures, the flight crew must first perform the ECAM actions (when applicable). After they should consider a potential system reset, then finally check the STATUS page.

- **Apply ECAM**

On all Airbus aircraft (except the A350), a failure sensed by the Flight Warning System (FWS) is announced to the crew via a specific ECAM alert (e.g. F/CTL ELEV SERVO FAULT) for application.

On the A350, a failure sensed by the FWS is announced to the crew via:

- a specific ECAM alert (e.g. SMOKE LAVATORY DET FAULT) for application in addition to a specific dispatch message on the DISPATCH page (e.g. > SMOKE LAVATORY DET) as guidance for entry into the MEL, when applicable, or
- a generic ECAM alert DISPATCH PAGE UPDATE (that appears on ground only) in addition to a specific dispatch message on the DISPATCH page (e.g. > AIR PACK 1 REGUL REDUNDANCY) as guidance for entry into the MEL, when applicable.

- **Consider System or Computer Reset**

After the completion of the ECAM actions and before the check of the STATUS page, the flight crew may consider a SYSTEM RESET as per FCOM/QRH SYSTEM/COMPUTER RESET TABLE (as applicable).

If the system reset is successful and the ECAM alert / Dispatch Message no longer appears, normal operation of the aircraft is recovered and the flight continues.

Note: On the A350, the SYSTEM RESET TABLE in the FCOM includes, in addition to the ECAM alerts, the Dispatch Messages, for which a reset can be directly attempted by the flight crew.

- **Verification of the STATUS page, if any**

An accurate reading of the STATUS page is essential to assess the aircraft technical status before takeoff.

If the aircraft performance is affected by a system failure: e.g. engine thrust limitation, degradation of aircraft retardation systems (brakes, spoilers etc.), the flight crew should perform a new computation of aircraft performance before takeoff.

Decision to Continue the Flight or to Return to Gate

Provided that it is compliant with the NAA regulations and the Airline policy documented in the MEL, the Captain may decide to continue the flight based on their good judgment and airmanship.

The decision should be taken based on the consideration of the operational effect of the failure for the current flight and for the next flight sectors.

To better assess the situation, the Captain may also refer to the MEL, with the support of the Airline dispatch and/or maintenance organizations, as needed.

If the aircraft technical status is compliant with the MEL dispatch conditions (including (o) procedure and operational restrictions, if any), the flight may continue.

Note: It is not necessary to return to the gate to make a logbook entry and to issue a new Certificate of Release to Service (CRS). The failure must be reported in the technical logbook for the next flight.

If the aircraft technical status does not comply with the MEL dispatch conditions and provided that the decision process complies with NAA regulation and the Airline policy, the Captain may decide to continue the flight.

The following guidelines may help the Captain to better assess the situation for the current flight and for next flight sectors:

- Confirm the availability of the maintenance support at destination to prevent operational disturbances (e.g. to prevent a potential Aircraft On-Ground (AOG) situation at destination)
- Consider the performance penalties as informed in the MEL (i.e. takeoff performance, fuel consumption increase, etc.)
- Consider the operational restrictions as informed in the MEL (e.g. loss of the RNP AR capability, degradation of the landing capability, degradation of the RVSM/RNP capability, degradation of the ETOPS capability, etc.)
- Consider the environmental restrictions as informed in the MEL (e.g. OAT limitations, icing conditions limitations)
- Consider the crew workload
- Consider the possible inter-relationship between all deferred MEL items (cumulative dispatch conditions requirements, etc.)

Conclusion

As per regulations, the Operator must define in its MEL a procedure for the management of failures that occur on ground during taxi when the aircraft moves under its own power.

When a failure occurs during taxi, as per local regulations and Airline policy, the Captain may decide to continue the flight after the assessment of the situation elaborated based on ECAM information.

Communication with dispatch and/or maintenance organizations with the consultation of the MEL may help the flight crew to better assess the situation.

The final decision to dispatch the aircraft is the responsibility of the Captain. This decision should be based on operational consideration that may impair the current flight or the subsequent missions of the aircraft.

In all cases, a process to make a Captain's decision must be defined in the Operator's MEL in accordance with their NAA regulations.

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