

International Maintenance Review Board Policy Board (IMRBPB)
Issue Paper (IP)

Date: 27 Oct 2009

CIP Number: 2008-6 (replaces IPy dated 14 Apr 2006)

Rev 1 dated 13 Feb 2010

Title: Handling of failures/degradations evident by non-AFM driven flight crew actions

Submitter: Airbus

Issue:

A consistent approach for handling failures/degradations that will be identified by flight crew actions not explicitly mentioned in the AFM should to be identified in MSG-3.

Problem:

Recent revisions of MSG-3 have concluded that only those flight crew ‘normal duties’ described in the AFM can be considered in determining that a Functional Failure is evident. Though this instruction is clear, it leads to a conservative approach with the potential for the selection of unnecessary maintenance tasks that require accomplishment procedures identical to those performed by flight crew as part of basic airmanship.

Neither Industry nor the Regulatory Authorities have been able to identify an agreed list of actions a flight crew can be expected to perform as part of their normal duties. The absence of such a list leads some OEMs to use engineering judgement to declare a functional failure as evident. However, in line with MSG-3 paragraph 2-3-5.1, the failures should be considered ‘hidden’. This leads to FEC8 or 9 analyses depending on consequence of a second failure. Those leading to FEC8 require an MRB task to be developed. Such a task is not necessary if it is considered evident through actions the crew perform during their normal duties.

Note: If there is any doubt of a functional failure being evident as a result of crew normal duties then current MSG-3 logic is applicable.

Various options have been followed by OEMs to avoid unnecessarily restrictive MRB tasks. Those OEMs that have selected tasks have either quoted the interval as ‘daily’ (which closely corresponds to the practice) or have taken credit for the expected crew actions and have quoted much higher intervals. In both cases the task has no value as a maintenance task. Other OEMs have taken credit for airmanship issues in another way and have declared the failure as evident. This drives FEC 6 or 7 analyses with no maintenance task being selected.

Recommendation (including Implementation):

MSG-3 should acknowledge that the flight crew perform routine actions that are not mandated through the Aircraft Flight Manual. Some of these actions allow Functional Failures to be identified. Analysts should have the possibility to declare that these actions constitute basic airmanship and thus certain Functional Failures can be declared as evident.

The validity of such decisions should be either justified through written communication with the manufacturer’s Flight Operations / Training departments (with additional support from representatives of operator’s Flight Crew communities in order to ensure that such actions will never cease) or be shown to be included in the minimum syllabus required by an Operational Suitability Certificate (or equivalent).

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It is proposed that the following paragraph is added in 2-3-5.1:

The MSG-3 analyst may assess that a Functional Failure is made evident by flight crew actions not mandated through the AFM providing that either:

- written confirmation is available from manufacturer's Flight Operations / Training department to confirm that such actions constitute basic airmanship and will always be performed, or**
- the actions that highlight the functional failures are part of an approved 'minimum syllabus'.**

Possible examples where the revised logic might be used:

- adjustment of crew seat position
- ability to lock the crew door
- crew oxygen pressure is within limits

IMRBPB Position:

Date:

Position:

Status of Issue Paper (when closed state the closure date):

Recommendation Implementation:

Important Note: The IMRBPB positions are not policy. Positions become policy only when the policy is issued formally by the appropriate National Aviation Authority. (EASA, JAA, FAA, or TCCA)

2-3-5. Consequences of Failure (First Level)

The decision logic diagram (Ref. [\[Figure 2-2.1\]](#)) facilitates the identification of the tasks required. There are four first level questions.

1. Evident or Hidden Functional Failure

QUESTION 1:

IS THE OCCURRENCE OF A FUNCTIONAL FAILURE EVIDENT TO THE OPERATING CREW DURING THE PERFORMANCE OF NORMAL DUTIES?

This question asks if the operating crew will be aware of the loss (failure) of the function during performance of normal operating duties. Question 1 must be asked for each functional failure of the item being analyzed. The intent is to segregate the evident and hidden functional failures. The operating crew consists of qualified flight compartment and cabin attendant personnel who are on duty. Normal duties are those duties associated with the routine operation of the aircraft on a daily basis.

If there is uncertainty about the frequency of use of certain systems, and assumptions are to be made, then the assumptions made must be recorded in the analysis for later verification. This applies equally to assumptions made concerning tests that are performed automatically by electronic equipment.

Ground crew is not part of the operating crew.

Flight crew "normal duties" are described (in part) in the Airplane Flight Manual (AFM) and must be accomplished by the flight crew. Working groups may consider these flight crew checks part of the operating crew's "normal duties" for the purpose of categorizing failures as evident in the MSG-3 analysis. It should be documented in the analysis whenever credit is taken for such flight crew checks.

Since the AFM is not available during the initial MSG-3 analysis, working groups should document all Level 1 failure analysis that is based on flight crew checks assumed to be included in the AFM. Once the AFM is available, all Level 1 analyses based on such assumptions must be verified to ensure that these checks are included in the AFM. Level 1 analysis must be redone for any assumed flight crew check not included in the AFM. System failures which are indicated to the operating crew when performing their normal duties shall be considered as evident.

NOTE: Evidence of AFM tasks which are assumed in the MSG-3 Level 1 analysis submitted to the MRB must be available prior to the MRB Report approval; otherwise, the MSG-3 Level 1 analysis submitted to the MRB must be based on the assumption that these tasks are not part of the crew's normal duties.

A "YES" answer indicates the functional failure is evident; proceed to Question 2 (Ref. [\[Heading 2-3-5.2\]](#)).

A "NO" answer indicates the functional failure is hidden; proceed to Question 3 (Ref. [\[Heading 2-3-5.3\]](#)).

The following text will need to be integrated in the above paragraph after agreement. This will cause the current wording above to be modified to clarify that inclusion of the crew action in the AFM is not the only means to declare the functional failure as evident.

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The MSG-3 analyst may assess that a Functional Failure is made evident by flight crew actions not mandated through the AFM providing that either:

- written confirmation is available from manufacturer's Flight Operations / Training department to confirm that such actions constitute basic airmanship and will always be performed, or
- the actions that highlight the functional failures are part of the approved 'minimum syllabus' defined in the frame of an Operational Suitability Certificate (OSC) such as that proposed by EASA through NPA 2009-01

CIP 2008-5

The pre-flight inspection is not to be considered as a maintenance function. It is required by Operational rules and may be performed by any appropriately trained person. The content of this inspection is practically identical for all aircraft types. The MSG-3 analyst may justify that certain failures / degradations will definitely be seen and addressed as a result of accomplishment of this operational requirement. Thus, in answering Question 1, a Functional Failure may be answered 'Yes' if it is certain that the Failure Cause(s) will be evident during the pre-flight inspection.