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

Initial Date: 24/FEB/2014
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Title: Definition of Visual Check.

Applies To:	
Vol 1:	
Vol 2:	
Both:	X

Submitter: EASA, MRB Section

Issue: MSG-3 currently uses exactly the same definition for Visual Check and for Operational Check (except for the word "task" and "observation").
However there is more fundamental difference between those two task types.

Problem: So far MSG-3 states:

Operational Check — An operational check **is a task** to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task.

Visual Check — A visual check **is an observation** to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task.

Except for the task/observation difference, the definition is identical.

This is not fully correct, one main difference is that for an **operational check** you have to run/operate the according system/component to verify that it is fulfilling its intended purpose. This is a "positive check" to verify operation.
A typical example would be the operational check of the landing light, you switch on (operate) the landing light, and check that it lights up (fulfills its intended function).

For a **visual check** on the other hand you do not need to run/operate the according system/component, you just **visually determine a condition of an item**. This can be a "positive check" to verify a condition or a "negative check" to verify that a certain condition is not existing.
In any case a check is a simple pass/fail determination not requiring quantitative assessment or acceptance/rejection criteria.

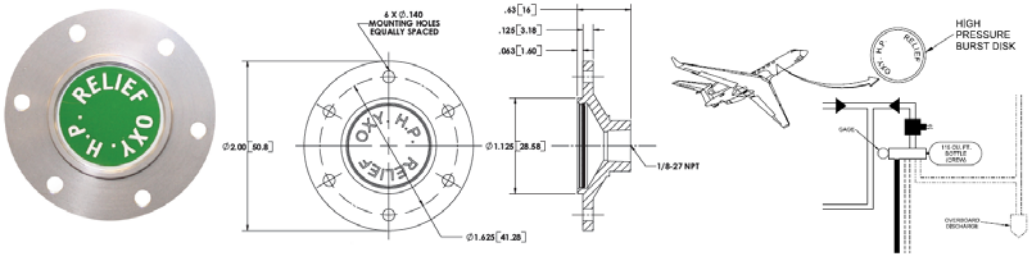
In many MRBRs of several manufacturers you can find plenty of examples where the Visual Checks selected do clearly not verify that certain items are fulfilling their intended purpose, but just verify their presence or condition.

The next page illustrates some examples.

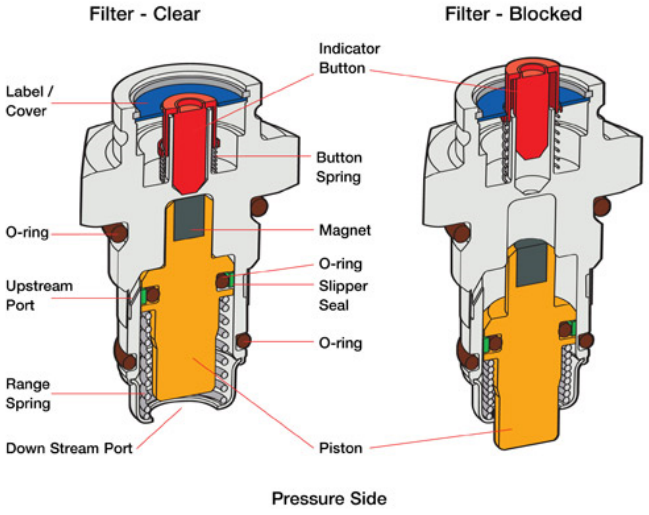
- You can do a visual check of an emergency slide pressure bottle or fire extinguisher for correct pressure without operating the slide or a fire extinguisher. You just visually determine whether the pressure gauge needle is in the green arc, or is not in the red arc(s).
  You do not check whether the slide/fire extinguisher fulfills its intended function.

- You can do a visual check of an IDG oil level without running the engine. You just visually determine that the oil level visible in the sight glass is between the "drain" and the "minimum" line, in the green range, or visible in the glass (depending on the exact design), You do not check whether the IDG or the oil fulfills its intended function.

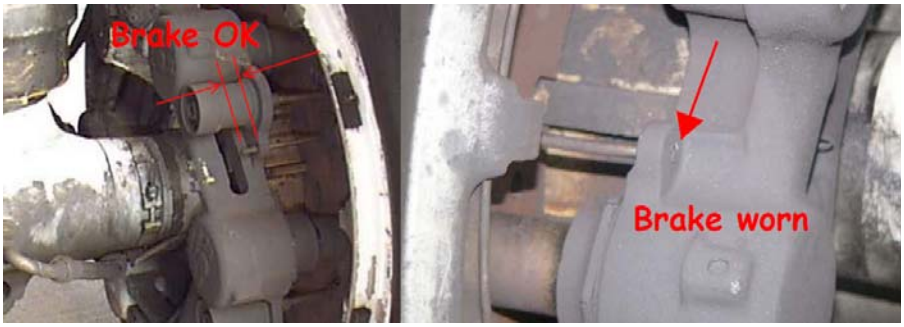
- You can do a visual check of a crew oxygen system burst disk without operating the oxygen system. You just visually determine that the burst disk is still there.
  You do not check whether the burst disk fulfills its intended function.



- You can do a visual check of an APU oil filter pressure difference indication without operating the APU by just looking at the pop-out indicator and verifying that the red pin is <u>not</u> visible. (this is an example for a "negative check")
  You do not check whether the pop out indicator or the oil filter fulfills its intended function (the indicator may for example be stuck in the non-indicating position).



- You can do a visual check of the brake wear pins without operating the brake (the parking brake might be required to be set, which makes this a borderline case as this might be understood as operation, it may however be part of the maintenance condition)
  You do not check whether the brake operates (does provide a braking moment to slow down the aircraft or hold it in position), you just visually check whether the pin is protruding from the caliper.



Additionally a visual check has an **obvious pass/fail criteria** that can be understood after a general training without the need of specific handbook instructions, and of course without any quantitative assessment and without any test equipment. Therefore, if the according item is obviously visible, a **Zonal Inspection can potentially cover the Visual Check** as the absence of the intended condition of a specific item is an obvious irregularity of the area, installation or assembly to be inspected.

Recommendation (including Implementation):

Update the systems chapter (Level 2 analysis)
Update Table 2-3-7.1. : Criteria for Task Selection
Update the glossary of Terms

Proposed changes to IP143 initial revision are highlighted in red.

2. Operational/Visual Check (Hidden Functional Failure Categories Only)

QUESTION 8B & 9B.	**IS AN OPERATIONAL OR VISUAL CHECK TO DETECT HIDDEN FAILURE APPLICABLE AND EFFECTIVE?**

An operational check is a task to determine that an item is fulfilling its intended purpose. The check does not require quantitative tolerances. This is a failure finding task.

A visual check is an observation to determine that an item is in its intended state . Does not require quantitative tolerances. This is a failure finding task with obvious pass/fail criteria.

NOTE:	A Visual Check identified through application of Systems/Powerplant logic may not subsequently be considered as covered by a zonal inspection as described in paragraph 2-5-1(j) if it is derived from a Category 8 analysis. At the level of the originating document, such a task must be retained as a standalone Visual Check task within the MSI from which it was identified.

2.1. Applicability Criteria

Operational Check :
Confirmation that an item is fulfilling its intended purpose must be possible.

Visual Check :
Visual identification of pass/fail state must be possible.

Note: The Item to be visually checked is not necessarily the item fulfilling the function analyzed, it may only be an indicator for the availability of the hidden function, e.g. an escape slide bottle pressure indicator.
State must be obvious in maintenance condition after gaining access and does not require quantitative assessment, e.g. a pressure gauge must have a green and/or a red arc or line to obviously indicate a state to make a visual check applicable.

2.2. Effectiveness Criteria - Safety

Operational Check :
The task must ensure adequate availability of the hidden function to reduce the risk of multiple failures.

Visual Check :
The task must confirm a state of a component which indicates that a function required for safe operation is available and reduces the risk of multiple failures.

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2.3. Effectiveness Criteria - Economic

Operational Check :
The task must ensure adequate availability of the hidden function in order to avoid economic effects of multiple failures and must be cost-effective.

Visual Check :
The task must be cost effective, i.e. the cost of the task must be less than the cost of the combined functional failure

prevented by timely detection of the hidden failure.

TASK	APPLICABILITY	SAFETY EFFECTIVENESS	OPERATIONAL EFFECTIVENESS	ECONOMIC EFFECTIVENESS
LUBRICATION OR SERVICING	The replenishment of the consumable must reduce the rate of functional deterioration.	The task must reduce the risk of failure.	The task must reduce the risk of failure to an acceptable level.	The task must be cost effective.
OPERATIONAL CHECK	Confirmation that an item is fulfilling its intended purpose must be possible.	The task must ensure adequate availability of the hidden function to reduce the risk of ~~a~~ multiple failures.	Not applicable.	The task must ensure adequate availability of the hidden function in order to avoid economic effects of multiple failures and must be cost effective.
VISUAL CHECK	Visual identification of pass/fail state must be possible	The task must confirm a state of a component which indicates that a function required for safe operation is available and reduces the risk of multiple failures.	Not Applicable	The task must be cost effective, i.e. the cost of the task must be less than the cost of the combined functional failure prevented by timely detection of the hidden failure
INSPECTION OR FUNCTIONAL CHECK	Reduced resistance to failure must be detectable, and there exists a reasonably consistent interval between a deterioration condition and functional failure.	The task must reduce the risk of failure to assure safe operation.	The task must reduce the risk of failure to an acceptable level.	The task must be cost effective; i. e., the cost of the task must be less than the cost of the failure prevented.
RESTORATION	The item must show functional degradation characteristics at an identifiable age, and a large proportion of units must survive to that age. It must be possible to restore the item to a specific standard of failure resistance.	The task must reduce the risk of failure to assure safe operation.	The task must reduce the risk of failure to an acceptable level.	The task must be cost effective; i.e., the cost of the task must be less than the cost of the failure prevented.
DISCARD	The item must show functional degradation characteristics at an identifiable age and a large proportion of units must survive to that age.	The safe life limit must reduce the risk of failure to assure safe operation.	The task must reduce the risk of failure to an acceptable level.	An economic life limit must be cost effective; i.e., the cost of the task must be less than the cost of the failure prevented.

Appendix A. Glossary

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Visual Check

A visual check is an observation to determine that an item is in its intended state. Does not require quantitative tolerances. This is a failure finding task with obvious pass/fail criteria.

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IMRBPB Position:

Date: 08/JUL/2015
Position: Correction introduced at Revision 1 accepted by IMRBPB by email

Status of Issue Paper (when closed state the closure date): Closed as IP N° 143 Rev 1 on the 08/JUL/2015

Recommendation for implementation:

Text change agreed for inclusion in MSG-3 2015.1.

Note:
When applying the latest revision of MSG-3 to an existing program, in order not to revise their platform, the OEM will not be required to change existing analysis templates to consider the new proposed wording of the questions. However, in order to accommodate associated changes, a PPH revision/appendix may be required.

Retroactive: ~~Y~~/ N

Important Note: The IMRBPB positions are not policy. Positions become policy only when the policy is issued formally by the appropriate National Aviation Authority.