



**Issue Paper (IP)**

**IP Number:** CIP EASA 2023-04

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**Retroactivity (N):**

<b>Title:</b>	Clarifications on the policy of “off-wing”, overhaul and restoration tasks
<b>Submitter:</b>	EASA

Applies To:	
MSG-3 Vol 1	X
MSG-3 Vol 2	X
IMPS	

**Issue:**

MSG-3 is not giving much information about consolidation of different tasks into an off-aircraft restoration task and identification of the scope of such tasks.

2-3-7.9: *"This paragraph applies to on-aircraft tasks only. Descriptions for off-aircraft restoration tasks may identify different task types."*

Glossary: *"That work necessary to return the item to a specific standard. Restoration may vary from cleaning or replacement of single parts up to a complete overhaul."*

Glossary: *"Since Restoration may vary from cleaning or replacement of single parts up to a complete overhaul, the scope of each assigned restoration task has to be specified"*

All three statements are fully correct, however they leave a lot of room for interpretation resulting in several different approaches by different manufacturers, and are often not in line with the according ICA (e.g. CMMs) and maintenance documentation resulting in many issues at operators and their regulatory authorities.

**Problem:**

**1. Restoration tasks that are not restoring**

There are manufacturers that per PPH call all off-aircraft tasks automatically RST, regardless the actual work scope.

Currently there are many existing MRBR tasks where the task procedure differs from the task title. For example, a series of off-aircraft checks is published as restoration task although nothing is restored.

This results in the issue, that an operator sends a unit to the workshop for restoration, and receives it in return with a release certificate (e.g. EASA Form 1, FAA 8130-3 Form) stating the unit is "tested", so formally it does not meet the MRBR requirement to restore it, so it should not be installed on the aircraft and the according aircraft level task should not be signed off.

There are repeated cases of discussion between operators and authorities about such issues.

It should be clear from MSG-3 Table 2-3-7.1 and paragraph 2-3-8.4, that restoration tasks and checks/inspections are selected and scheduled through different criteria, therefore it is important to use the actual task type(s), as it is later on described in the ICA, performed and stated on the release certificate, already during the MSG-3 analysis.



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It is therefore important to specify the correct task types for such restoration tasks, using a terminology that is in line with the ICA and the release certificate, for example: "restoration (off-aircraft testing) of the CVR"

## **2. Overhaul**

The term "overhaul" is used but not closer defined in MSG-3. A clear definition of "overhaul" is not included in any document related to the MRB or certification process. An indirect definition of overhaul can be found in release certificate guidance like for EASA Form 1 or FAA 8130-3 Form (identical wording):

*"OVERHAULED Means a process that ensures the item is in complete conformity with all the applicable service tolerances specified in the type certificate holder's, or equipment manufacturer's instructions for continued airworthiness, or in the data which is approved or accepted by the Authority. **The item will be at least disassembled, cleaned, inspected, repaired as necessary, reassembled and tested in accordance with the above specified data**"*

For mechanical components it is not unusual to lubricate them during assembly, or to fill the unit with lubricant at the end of the assembly procedure. It is also common practice to discard certain components during an overhaul, typically during disassembly.

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An overhaul can therefore be linked to the following MSG-3 task types:

EASA/FAA Form1 / 8130-3 wording	ATA CMM Standards (Examples)		ATA MSG-3	
	ATA 100	iSpec 2200	Task Type	potentially included
disassembled	<b>E. Disassembly</b> This section shall contain instructions for a complete disassembly of the component	<b>2.4. Disassembly</b> shall contain instructions for a complete disassembly of the component, Provide step-by-step disassembly instructions in a logical sequence		DIS
cleaned	<b>F. Cleaning</b> This section shall specify methods and processes, or refer to applicable Standard Practices, required for cleaning specific parts or areas of the component. Provide step-by-step procedures that follow a logical work-flow sequence. Where required, include procedures for paint removal.	<b>2.5. Cleaning</b> specify methods and processes, or refer to applicable Standard Practices, required for cleaning specific parts or areas of the component. Provide step-by-step procedures that follow a logical workflow sequence.	RST	
inspected	<b>G. Inspection/Check</b> the detailed procedures required to determine the serviceability of a part, assembly, specific inter-relationship of parts that perform a functional operation, etc.	<b>2.6 Inspection/Check</b> the detailed procedures required to determine the serviceability of a part, assembly, specific inter-relationship of parts that perform a functional operation, etc.	GVI, DET, SDI	
repaired as necessary	<b>H. Repair</b> This section shall contain detailed repair procedures and specifications necessary for <b>restoring a component</b> to serviceable condition.	<b>75. Repair</b> contains detailed repair procedures and specifications necessary for <b>restoring a component</b> to serviceable condition.		RST
reassembled	<b>J. Assembly</b> Assembly instructions for a complete build up of the component. Provide a list at the beginning of this section of required materials, tools, fixtures, equipment and consumables (e.g., <b>lubricants</b> ) If applicable, fully cover the procedures for sealing, cementing, <b>lubricating</b> , etc.	<b>76. Assembly</b> Assembly instructions for a <b>complete build up</b> of the component. Provide for <b>calibration or tests</b> in this subheading when such procedures cannot be accomplished after final assembly, or when it is simply more practical to accomplish them during assembly.		LUB OPC FNC RST
tested	<b>C. Testing and Fault Isolation</b> This section shall contain specific tests and procedures required to determine the condition of a component. A detailed <b>return-to-service test</b> shall be provided or referenced.	<b>70. Testing and Fault Isolation</b> This section shall contain specific tests and procedures required to determine the condition of a component, and <b>return it to service</b> .	OPC FNC	

So a full overhaul (as off-aircraft restoration task) is able to accommodate any MSG-3 task type, on the other hand a restoration task can only be described as "overhaul" if all of the above listed task types are included.



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The current MSG-3 statement of paragraph 2-3-7.9: "*Descriptions for off-aircraft restoration tasks may identify different task types.*" is clear for overhaul tasks but up to interpretation for a combination of some off-aircraft tasks not describing a full overhaul.

The meaning of "*may*" is unclear, is it an exemption from the general rule that "*Task consolidation is normally not acceptable*", or is it optional to identify the task types in the description of off-aircraft restoration tasks, which somehow contradicts the idea that *the scope of each assigned restoration task has to be specified* ?

### **3. Task procedure preventing Restoration**

ATA Standards for CMM format do include the statement:

*"Place a NOTE at the beginning of this Pageblock [Disassembly] that refers to Testing and Fault Isolation for establishing the condition of the component or most probable cause of detected malfunction(s) to determine extent of disassembly required. **Disassembly should only be performed to the extent necessary to access any faulty subassembly.**"*

This statement has been created for restoration tasks that result from in-service failure or failed inspections/checks and is contradicting scheduled overhaul tasks where the need for full disassembly is already determined through the MSG-3 analysis and should not be interfered with at ICA level.

Accordingly there are many CMMs that include even more specific wording, which states, for the disassembly step of an overhaul, that before performing a disassembly the unit should be tested and, if it performs satisfactory, it should not be disassembled (or not be disassembled completely).

This results in MRBR RST tasks, that in fact are just off-aircraft checks. If the unit passes the check, it will be returned to service unchanged or only partly restored in line with approved ICA. The real task that has been selected as applicable and effective during L2 analysis will never be performed, the task interval has been selected using the wrong philosophy (see 2-3-8.4, RST intervals are based on age or time a degradation needs to grow from new/restored to failure while Inspection/Check intervals are based on the much shorter PtoF interval, or time a degradation needs to grow from detectable level to failure).

It is absolutely acceptable to have MRBR checks that for practical reason are performed off-aircraft and typically involve rotating the part. However, these tasks should not be called or analysed as "*restoration*" tasks, as in fact they do not *return the item to a specific standard* but do only *determine if one or more functions of an item performs within specified limits or determine that an item is fulfilling its intended purpose*.

If it is clear that a formal restoration task is in fact only a check (and as *all available Vendor Recommendations should be fully considered, discussed in the MWG meetings, and accepted only if they are applicable and effective according to MSG-3 criteria*, this should be clear to the WG), then only this check should be selected as MRBR task in line with the according applicability and effectiveness criteria and interval selection.



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#### 4. Consolidated VR

There are many VRs existing which do consolidate MSG-3 compatible subtasks with some that do not meet MSG-3 criteria for applicable and effective tasks. This is especially the case if the VR is not formally a CMM and/or does not follow the standards for CMM authoring. For example, several vendors do link the functional check / calibration of the pressure regulator or the discard of the seals to the hydrostatic test of the pressure cylinder in a single task. There is no policy existing to "unbundle" such consolidated VR.

#### **Recommendation (including Implementation):**

The practice of consolidating several tasks of different type into an off-aircraft task and defining the task type as "restoration" as mentioned in 2-3-7.9 is fully supported, however the following important aspects need to be addressed:

- For single RST tasks directly selected through 5C/6C/7C/8D/9D the scope of the tasks must be known to the working group at a level of detail that allows to assess whether *they are applicable and effective according to MSG-3 criteria*;
- For consolidated RST tasks, all subtasks (or groups of similar subtasks as applicable) must be analysed in an individual level 2 analysis according to the correct criteria for applicability and effectiveness in line with Table 2-3-7.1 and scheduled in line with chapter paragraph 2-3-8.4 according to the task type (i.e. an SDI performed during an overhaul must be analysed as INSPECTION, not as RESTORATION);
- *The scope of each assigned restoration task has to be specified at a level of detail that allows to clearly link it to the different task types that have been consolidated into a single RST task, if it differs from a complete overhaul. The may statement of 2-3-7.9 refers to a deviation from the rule "Task consolidation is normally not acceptable", not to the need to identify the different task types*;
- The consolidated task as published in the MRBR must be in line with the scope of the off-aircraft ICA (e.g. CMM)
- Tasks where the vendor ICA include a "check first and do not restore if within limits" procedure, should not be selected as restoration task, but as off-aircraft check/inspection driving the restoration only in case the check/inspection fails (same MSG-3 philosophy as for on-aircraft tasks).

Additionally, to the specific wording of 2-3-7.9 it is also supported to list a consolidation of tasks of **the same** type (e.g. a series of checks) as a single off-aircraft restoration task, if the scope of the restoration task is clearly specified accordingly.

Several checks/inspections can be consolidated for example as "Restoration (off-aircraft testing) of the DFDR".



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Manufacturers should establish PPH policies that align selected wording as much as possible with wording used in the ICA and the regulation for the authorise release certificates (EASA Form 1, FAA 8130-3 Form etc. as applicable).

Typical restoration tasks with a dedicated scope could be for example

Restoration (battery discard and check) of the ELT	Consolidation of different task types into an off-aircraft restoration task, literally in line with 2-3-7.9
Restoration (off-aircraft calibration) of the pressure regulator	A real restoration task that returns the item to a specific standard
Restoration (overhaul) of the hydraulic isolation valve	A full overhaul can consolidate any task type and is off-aircraft by definition, no further details required
Restoration (off-aircraft testing) of the DFDR	Consolidation of <u>similar</u> task types into an off-aircraft restoration task, scope clearly specified

The following task descriptions however should be avoided

Restoration of the trim actuator	Scope of the restoration not specified although required by 2-3-7.5
Restoration (off-aircraft) of the pressure regulator	If in fact the regulator is just functionally checked (pressure, flow rate) off-aircraft, but not restored
Restoration (overhaul) of ELT	If nothing is disassembled or inspected, just the battery discarded, and the ELT operationally checked
Restoration (FNC of the power supply, OPC of the erase function, FNC of the sound recording quality of all 4 channels) of the CVR	The task description should not include the task procedure, just the basic scope, e.g. "testing". Detailed task data should remain in the MSG-3 Analysis or referenced VR (see IP 176)

## **Implementation:**

### **1) MSG-3 Revision 2018.1, Volume 1 – Fixed Wing Aircraft**

- Amend the VR statement in Chapter 2-3-2
- Add a note to the L2 Restoration Chapter 2-3-7.5
- Add "Overhaul" to the Glossary (Appendix A)

### **2-3-2. Analysis Procedure**

[...]

Tasks and intervals required in the scheduled maintenance are identified using the procedures set forth herein. Both the economic and safety related tasks are included so as to produce initial scheduled maintenance tasks/intervals.

All available Vendor Recommendations (VR) should be fully considered, discussed in the MWG meetings, and accepted only if they are applicable and effective according to MSG-3 criteria [and the VR procedures are in line with the scope and title of the task\(s\)](#).



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Prior to applying the MSG-3 logic diagram to an item, a preliminary work sheet will be completed that clearly defines the MSI, its function(s), functional failure(s), failure effect(s), failure cause(s) and any additional data pertinent to the item; e.g., ATA chapter reference, fleet applicability, manufacturer's part number, a brief description of the item, expected failure rate, hidden functions, need to be on M.E.L., redundancy (may be unit, system or system management), etc. This work sheet is to be designed to meet the user's requirements and will be included as part of the total MSG-3 documentation for the item.

## 2-3-7. Task Development (Second Level)

[...]

### 5. Restoration (All Categories)

That work necessary to return the item to a specific standard.

Since Restoration may vary from cleaning or replacement of single parts up to a complete overhaul, the scope of each assigned restoration task has to be specified.

#### 5.1. Applicability Criteria

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.

**Note:** By applying the second level of the MSG-3 logic diagram it should already have been assessed whether an Inspection/Functional Check can timely detect the functional degradation characteristics. The task procedure for a Restoration should therefore not start with an Inspection/Check that stops the restoration in case the item does not show functional degradation. If such a situation is encountered, the according off-aircraft Inspection/Check should be reassessed under bullet 4: Inspection/Functional Check (All Categories)

## Appendix A. Glossary

### Overhaul

A process that ensures the item is in complete conformity with all the applicable service tolerances specified in the type certificate holders, or equipment manufacturers instructions for continued airworthiness. The item will be at least disassembled, cleaned, inspected, repaired as necessary, reassembled and tested in accordance with the above specified data. Overhaul is the highest possible level of a restoration task and requires no further scope details.





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## **2) MSG-3 Revision 2018.1, Volume 2 – Rotorcraft**

- Amend the VR statement in Chapter 2-3-2
- Add a note to the L2 Restoration Chapter 2-3-7.5
- Add "Overhaul" to the Glossary (Appendix A)

### **2-3-2. Analysis Procedure**

[...]

Tasks and intervals required in the scheduled maintenance are identified using the procedures set forth herein. Both the economic and safety related tasks are included so as to produce initial scheduled maintenance tasks/intervals.

All available Vendor Recommendations (VR) should be fully considered, discussed in the MWG meetings, and accepted only if they are applicable and effective according to MSG-3 criteria [and the VR procedures are in line with the scope and title of the task\(s\)](#).

Prior to applying the MSG-3 Volume 2 logic diagram to an item, a preliminary work sheet will be completed that clearly defines the MSI, its function(s), functional failure(s), failure effect(s), failure cause(s) and any additional data pertinent to the item; e.g., ATA chapter reference, fleet applicability, manufacturer's part number, a brief description of the item, expected failure rate, hidden functions, need to be on M.E.L., redundancy (may be unit, system or system management), etc. This work sheet is to be designed to meet the user's requirements and will be included as part of the total MSG-3 Volume 2 documentation for the item.

### **2-3-7. Task Development (Second Level)**

[...]

## **5. Restoration (All Categories)**

That work necessary to return the item to a specific standard.

Since Restoration may vary from cleaning or replacement of single parts up to a complete overhaul, the scope of each assigned restoration task has to be specified.





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## 5.1. Applicability Criteria

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.

**Note:** By applying the second level of the MSG-3 Volume 2 logic diagram it should already have been assessed whether an Inspection/Functional Check can timely detect the functional degradation characteristics. The task procedure for a Restoration should therefore not start with an Inspection/Check that stops the restoration in case the item does not show functional degradation. If such a situation is encountered, the according off-aircraft Inspection/Check should be reassessed under bullet 4: Inspection/Functional Check (All Categories)

## Appendix A. Glossary

### Overhaul

A process that ensures the item is in complete conformity with all the applicable service tolerances specified in the type certificate holders, or equipment manufacturers instructions for continued airworthiness. The item will be at least disassembled, cleaned, inspected, repaired as necessary, reassembled and tested in accordance with the above specified data. Overhaul is the highest possible level of a restoration task and requires no further scope details.

### IMRBPB Position:

**Date:**

**Position:**

**Recommendation for Implementation:**

**Status of the Issue Paper:**

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Active

Incorporated in MSG-3 / IMPS (with details)

Archived