



Issue Paper (IP)

IP Number: CIP EASA 2023-08\_R02

Initial Date (DD/MMM/YYYY):

Revision - Date (DD/MMM/YYYY):

Effective Date (DD/MMM/YYYY):

Retroactivity (Y/N): N

<b>Title:</b>	Removal of not MSG-3 related Steps from the L/HIRF Protection Analysis Methodology and Logic Diagram
<b>Submitter:</b>	EASA

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

**Issue:**

Any L/HIRF Assurance Plan (or equivalent validation program) made available by the manufacturer when performing a L/HIRF MSG-3 analysis can be used as an additional source for information by the MSG-3 Working Group.

In no cases the L/HIRF Assurance Plan (or equivalent validation program) is related to the development/management of the MSG-3 analysis.

The possibility to use a L/HIRF Assurance Plan (or equivalent validation program) to cover the intent of an MSG-3 derived task cannot be assessed through the MSG-3 methodology: therefore, the L/HIRF Protection MSG-3 Logic Diagram should not provide any guidance on the possibility not to publish a L/HIRF MSG-3 derived task in the MRBR.

**Problem:**

The current L/HIRF MSG-3 analysis methodology has been introduced in MSG-3 rev. 2013.1, following the approval of IMRBPB IP 129 “Lightning/HIRF (L/HIRF) Methodology Clarifications” back in 2013.

The MSG-3 2022.1 document (Vol.1 and Vol.2) includes the L/HIRF Protection MSG-3 Logic Diagram (Figure 2-6-1.3 (part 2)).

The possibility to take credit for an existing L/HIRF Assurance Plan (or equivalent validation program) to select an applicable and effective “visual inspection” rather than more complex task is clearly recognized as an MSG-3 related application (i.e. notes in 2-6-1. Step 12 and Step 13):



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**Step 12: Can an applicable and effective task be accomplished without disassembly be selected? If so, select a task.**

Determine if the potential degradation is detectable by a maintenance task without disassembly. If disassembly is required in order to detect identified potential degradation, then proceed to Step 13. If potential degradation is detectable without disassembly, then select appropriate level task that is most applicable and effective in detecting potential degradation from the following:

1. GVI
2. DET
3. FNC
4. SDI

NOTE: If there is an L/HIRF Assurance Plan (or equivalent validation program) in place, more credit can be given to detect protection degradation through applicable and effective visual inspections.

**Step 13: Could disassembly significantly degrade the installation or impede ability to detect degradation? If not, select a task.**

Accomplish an assessment of the effects of disassembly and compare the installation's probability for degradation, versus the effect of the disassembly. Also, consider if disassembly would negatively affect the ability to detect the protection degradation.

If this assessment shows a task is applicable and effective with disassembly, then select from the following and proceed to Step 15:

1. GVI
2. DET
3. FNC
4. SDI
5. RST
6. DIS

If assessment shows that the negative effects of disassembly outweigh the benefits of maintenance proceed to Step 14.

NOTE: If there is an L/HIRF Assurance Plan (or equivalent validation program) in place, more credit can be given to detect protection degradation through applicable and effective visual inspections.

**That being said,** the workflow clearly shows that the L/HIRF MSG-3 analysis can be considered "completed" with Step 15:

**Step 15: For all tasks selected, identify the interval applicable for detecting potential degradation**

To determine the maintenance task interval, the Working Group considers the impact of the ED/AD threat on the protection characteristics using best judgment and available information of expected degradation.



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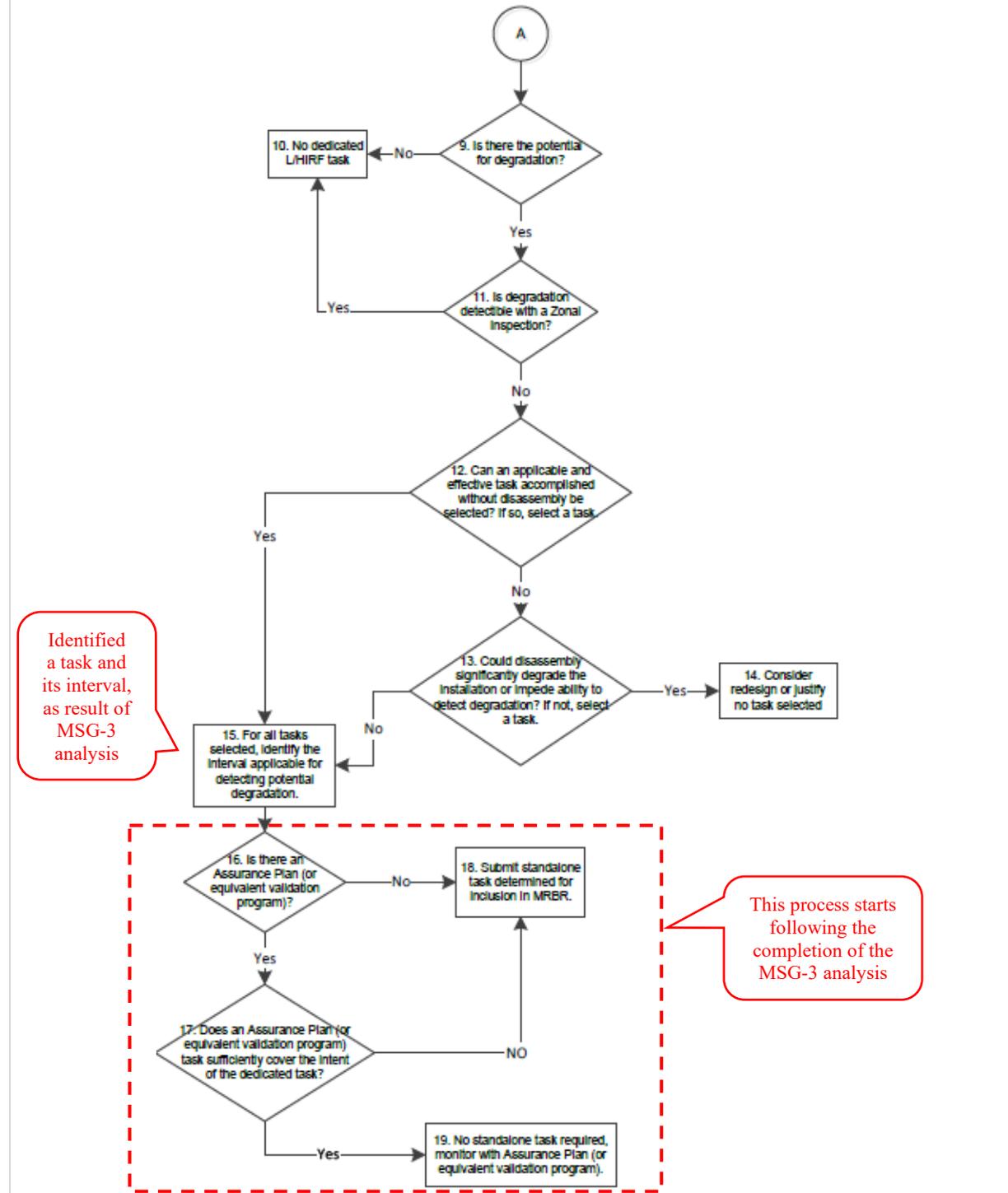
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The following steps, from Step 16 to Step 19, are instead describing a process that is clearly not dependent upon the MSG-3 methodology.

Figure 2-6-1.3 L/HIRF Protection MSG-3 Logic Diagram (part 2)





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As stated before, the current L/HIRF MSG-3 analysis methodology has been introduced in MSG-3 rev. 2013.1, following the approval of IMRBPB IP 129. The IMRBPB position as recorded in the IP 129 itself is the following:

*“Prior to the use of this new L/HIRF process an agreement is to be reached with the manufacturer regarding the use of an assurance plan. If an assurance plan is to be used during the L/HIRF MSG-3 analysis the applicable PPH must be updated to include this agreement, which will indicate roles and responsibilities.”*

At that time the IMPS document didn't exist (IMPS Issue 00 has been approved in 2016) and the MSG-3 analysis document was still the repository for information related to processes that are not dependent upon the MSG-3 methodology.

Following the first IMPS approval things started to change with the implementation of different IMRBPB IPs into the IMPS; as a consequence, MSG-3 analysis document has been revised as well, to limit the guidelines to those pertinent to the analysis within the frame of an MRB process (e.g. IP 171 “Scope of FD Analysis in MSG-3” and IP 204 “Removal of MRB and CMCC process coordination section from the MSG-3 document”).

Therefore, to be consistent with the dispositions approved by the IMRBPB within IP 129, guidance related to the impact that an L/HIRF Assurance Plan (or equivalent validation program) may have on the publication in the MRBR of L/HIRF MSG-3 derived tasks, as described in Steps from 16 to 19, should be removed from the MSG-3 document.

**Recommendation (including Implementation):**

A. It is recommended the following amendment to MSG-3 2022.1 Vol.1 and Vol.2:

- To amend MSG-3 Revision 2022.1, Volume 1 – Fixed Wing Aircraft, Para. 2-6-1.3. as follows

**Step 15: For all tasks selected, identify the interval applicable for detecting potential degradation**

To determine the maintenance task interval, the Working Group considers the impact of the ED/AD threat on the protection characteristics using best judgment and available information of expected degradation.

**~~Step 16: Is there an L/HIRF Assurance Plan (or equivalent validation program)?~~**

~~OEM to provide details to the Working Group that may include summary of anticipated test methodologies, sample size details, and general information on type and number of test points.~~

**~~Step 17: Does an L/HIRF Assurance Plan (or equivalent validation program) task sufficiently cover the intent of the dedicated task?~~**



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~~OEM must provide details in the L/HIRF Assurance Plan to satisfy the working group that the degradation concern is sufficiently covered. If the need for a task is based on unfavorable in-service experience, it is not a candidate for coverage by the L/HIRF Assurance Plan.~~

**Step 18 Step 16: Submit standalone task determined for inclusion in MRBR.**

All L/HIRF-derived stand-alone tasks should be uniquely identified in the MRBR for traceability during future changes. Once the analysis is completed, the resulting maintenance tasks and intervals for all L/HIRF systems are submitted to the ISC for approval and inclusion in the MRB Report proposal.

~~**Step 19: No standalone task required, monitor with an L/HIRF Assurance Plan (or equivalent validation program)**~~

~~OEM must ensure traceability of all dedicated tasks covered by the L/HIRF Assurance Plan, until Engineering and the ISC have agreed sufficient data has been collected to determine permanent disposition of the recommended dedicated task.~~

~~NOTE: If an L/HIRF Assurance Plan is discontinued, OEM has responsibility to either use the collected data to support "No dedicated task required" or to institute the original dedicated task into the maintenance program.~~



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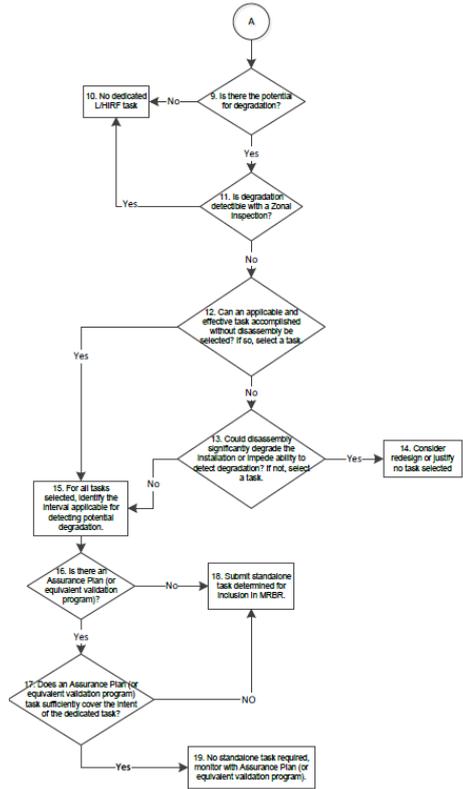
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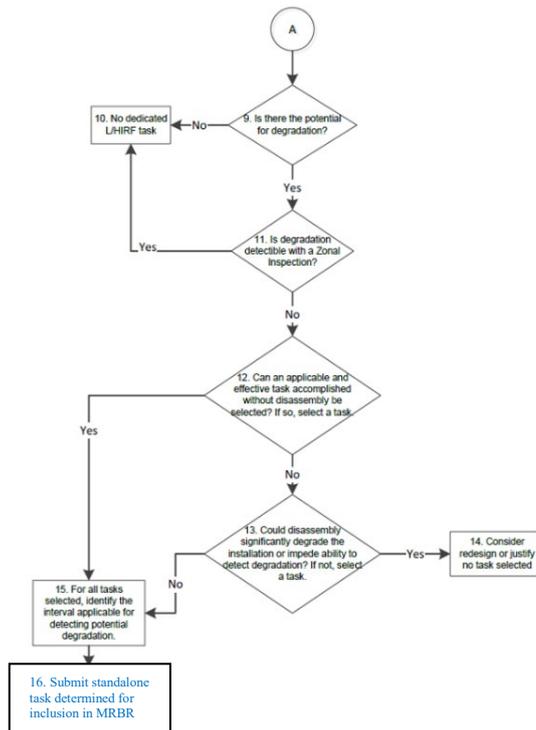
Retroactivity (Y/N): N

- 2. To amend MSG-3 Revision 2022.1, Volume 1 – Fixed Wing Aircraft, Figure 2-6-1.3 L/HIRF Protection MSG-3 Logic Diagram (part 2) as follows:

from:



To:





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**Retroactivity (Y/N): N**

3. To amend MSG-3 Revision 2022.1, Volume 1 – Fixed Wing Aircraft, Para. 2-6. as follows:

**2.6 Lightning/High Intensity Radiated Field (L/HIRF) Analysis Procedure**

[...]

1. L/HIRF protection relies on both external and internal L/HIRF protection components.  
[...]

2. Use of Lightning/HIRF Assurance Plan Philosophy

L/HIRF Assurance Plans, regardless of source, can be used to validate L/HIRF protection performance and/or maintenance program effectiveness.

~~After a task is proposed through the MSG-3 analysis process and where an L/HIRF Assurance Plan (or equivalent validation program) exists, the philosophy used in the L/HIRF MSG-3 logic is to either retain the proposed task or use the L/HIRF Assurance Plan (or equivalent validation program) to cover the intent of the MSG-3 task. For example, in cases where there is little data and the potential for degradation is low, an LHSI may be more effectively covered by the L/HIRF Assurance Plan.~~

3. Good Performance Philosophy

[...]

4. To amend MSG-3 Revision 2022.1, Volume 2 – Rotorcraft, Para. 2-6. as follows:

**2.6 Lightning/High Intensity Radiated Field (L/HIRF) Analysis Procedure**

[...]

1. L/HIRF protection relies on both external and internal L/HIRF protection components.  
[...]

2. Use of Lightning/HIRF Assurance Plan Philosophy

L/HIRF Assurance Plans, regardless of source, can be used to validate L/HIRF protection performance and/or maintenance program effectiveness.

~~After a task is proposed through the MSG-3 analysis process and where an L/HIRF Assurance Plan (or equivalent validation program) exists, the philosophy used in the L/HIRF MSG-3 logic is to either retain the proposed task or use the L/HIRF Assurance Plan (or equivalent validation program) to cover the intent of the MSG-3 task. For example, in cases where there is little data and the potential for degradation is low, an LHSI may be more effectively covered by the L/HIRF Assurance Plan.~~

3. Good Performance Philosophy

[...]



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5. To amend MSG-3 Revision 2022.1, Volume 2 – Rotorcraft, Para. 2-6-1.3. as follows:

**Step 15: For all tasks selected, identify the interval applicable for detecting potential degradation**

To determine the maintenance task interval, the Working Group considers the impact of the ED/AD threat on the protection characteristics using best judgment and available information of expected degradation.

~~**Step 16: Is there an L/HIRF Assurance Plan (or equivalent validation program)?**~~

~~OEM to provide details to the Working Group that may include summary of anticipated test methodologies, sample size details, and general information on type and number of test points.~~

~~**Step 17: Does an L/HIRF Assurance Plan (or equivalent validation program) task sufficiently cover the intent of the dedicated task?**~~

~~OEM must provide details in the L/HIRF Assurance Plan to satisfy the working group that the degradation concern is sufficiently covered. If the need for a task is based on unfavorable in-service experience, it is not a candidate for coverage by the L/HIRF Assurance Plan.~~

**Step 18 Step 16: Submit standalone task determined for inclusion in MRBR.**

All L/HIRF-derived stand-alone tasks should be uniquely identified in the MRBR for traceability during future changes. Once the analysis is completed, the resulting maintenance tasks and intervals for all L/HIRF systems are submitted to the ISC for approval and inclusion in the MRB Report proposal.

~~**Step 19: No standalone task required, monitor with an L/HIRF Assurance Plan (or equivalent validation program)**~~

~~OEM must ensure traceability of all dedicated tasks covered by the L/HIRF Assurance Plan, until Engineering and the ISC have agreed sufficient data has been collected to determine permanent disposition of the recommended dedicated task.~~

~~NOTE:— If an L/HIRF Assurance Plan is discontinued, OEM has responsibility to either use the collected data to support “No dedicated task required” or to institute the original dedicated task into the maintenance program.~~



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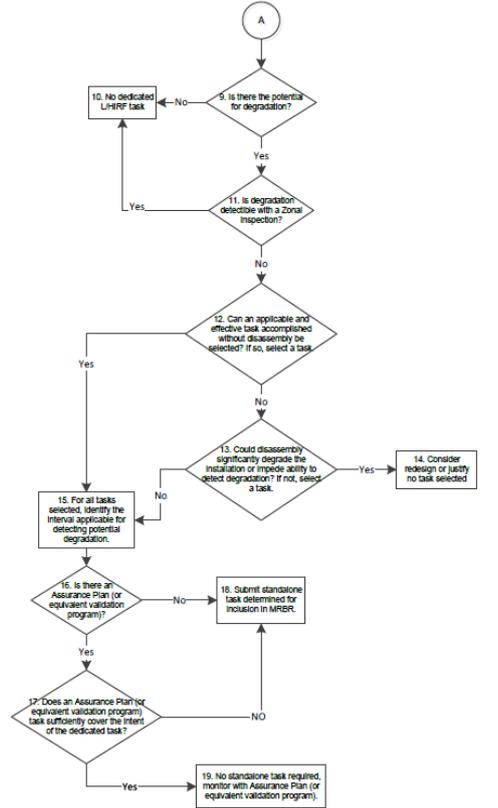
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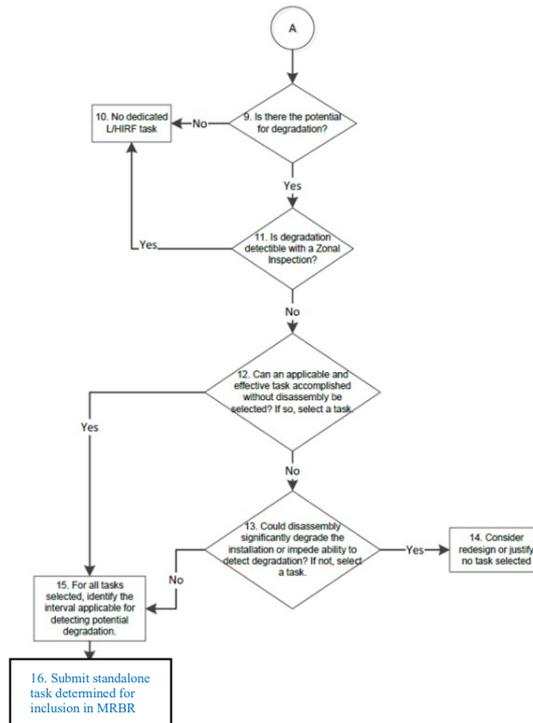
Retroactivity (Y/N): N

- 6. To amend MSG-3 Revision 2018.1, Volume 2 – Rotorcraft, Figure 2-6-1.3 L/HIRF Analysis Methodology Logic Diagram (Part 2) as follows:

from:



to:





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- B. To amend IMPS Issue 02 to revise the paragraph 4.10.4 to reflect the IMRBPB position as recorded in the approved IP 129:

4.10 Specific Considerations for L/HIRF

4.10.1 L/HIRF tasks should reside in the Systems/Powerplant section of the MRBR. However, the MRBR may include a section for unique L/HIRF requirements rules when deemed necessary by MRB/ISC/TCH.

4.10.2 The MRBR should identify L/HIRF tasks in a manner mutually acceptable to the MRB/ISC/TCH and this shall be documented in the PPH.

4.10.3 The MRBR should contain information that L/HIRF dedicated tasks typically reside in ATA 20 of the Systems /Powerplant section of the MRBR and do not have an FEC.

4.10.4 ~~During the L/HIRF task development if an Assurance Plan is required to support the MSG-3 analysis, the details of the Assurance Plan should be referenced in the MRBR.~~

An agreement is to be reached between MRB, ISC and TCH regarding the use of an assurance plan. If an assurance plan is to be used during the L/HIRF MSG-3 analysis the applicable PPH must be updated to include this agreement, which will indicate roles and responsibilities.

IMRBPB Position:

<b>Date:</b>	
<b>Position:</b>	
<b>Recommendation for Implementation:</b>	

<b>Status of the Issue Paper:</b>	<input type="checkbox"/>	Active
	<input type="checkbox"/>	Incorporated in MSG-3 / IMPS (with details)
	<input type="checkbox"/>	Archived