Initial Date: 06 Oct 2010
IP Number: CIP-IND-2010-4
Revision / Date: Rev.0 /06 Oct 2010

Title: Clarification of the MSG-3 L/HIRF flow chart further to MWG experience.

Submitter: Joint Industry Proposal (Airbus, Boeing, …)

Issue: The current MSG-3 L/HIRF logic can be amended to improve the application / consideration of the procedure. The existing flow chart has duplications that do not add to the process. These duplications generate issues of misinterpretation and misunderstanding when the procedure is applied.

Recommendation (including Implementation):

The MSG-3 L/HIRF logic should be amended to remove the duplications. Such amendment would provide a clearer view on the logic concept and a direct visibility of the results associated with the various decision steps (e.g. either the demonstrated design robustness can be used to justify that no dedicated L/HIRF task is required or the anticipated degradation will need to be addressed by definition of an applicable and effective maintenance task. If neither of these can be declared, redesign is to be considered).

The MSG-3 L/HIRF section should be revised as follows:

[…]

3. L/HIRF Protection Analysis Process and Flowchart (see Figure 2-6-1.3)

1) Provide a description of the L/HIRF protection systems and assemble a list of L/HIRF protection components by zone whose failure could have an adverse effect on safety. This should include the identification of the criticality of the failure condition associated with the potential degradation of the L/HIRF protection for this zone. Protection within a given zone should include both electrical and non-electrical protection components. Create a matrix that lists the location of each component within the zone. Examples of electrical components include: Wire shielding, pigtail terminations, backshells, bonding straps, etc. Examples of non-electrical components include: metallic meshes, raceways, conductive gaskets, conductive coatings, structure and substructure, etc.

2) Provide the component characteristics and applicable performance data (if available) for each protection component within a zone. Protection component characteristics are properties that are relied upon to provide L/HIRF protection such as resistance to corrosion, effects of environment and robustness of design. Examples of applicable performance data include: developmental data, qualification test data, in service data etc.

3) Identify potential degradation of the characteristics for protection components within the zone. Describe the zone environment. This should include considerations of surrounding (adjacent/above/below) zones that may have an impact on the zone environment. Define each protection component degradation and applicable test data, if available, that identified the degradation. Also include any in-service experience that may have been accumulated from similar protection components currently in-service for each degradation type. In-service includes data gathered during maintenance or performance validation tests. Details associated with the level of degradation and types of degradation are also included in this step in order to benchmark expected in-service performance. (Note: An engineering validation program may be utilized to gather in-service data for maintenance programs and validating the design. Results of such an in-service validation program may be provided as part of updates to the MSG-3 analysis and maintenance program. This data can be analyzed, evaluated, and interpreted by the OEM engineering team for use in determining protection improvements

and/or maintenance program adjustments.)

4) Are characteristics of the protection components susceptible (i.e., particularly sensitive) to Environmental Deterioration and Accidental Damage (ED/AD)? A process will be developed and utilized by the working group to determine a rating of the susceptibility of the protection components to ED/AD.

5) No dedicated L/HIRF maintenance task selected.

6) Select applicable and effective L/HIRF maintenance task and interval to detect degradation. Using best judgment and available information, the task and assigned interval must reduce the risk of failure to assure safe operation.

7) Was a task identified? (self-explanatory)

~~6)~~8) Will the failure condition due to the expected degradation (including common mode in localized area) in combination with an L/HIRF event prevent the continued safe flight and landing of the aircraft?

9) Is the task a GVI? (self-explanatory)

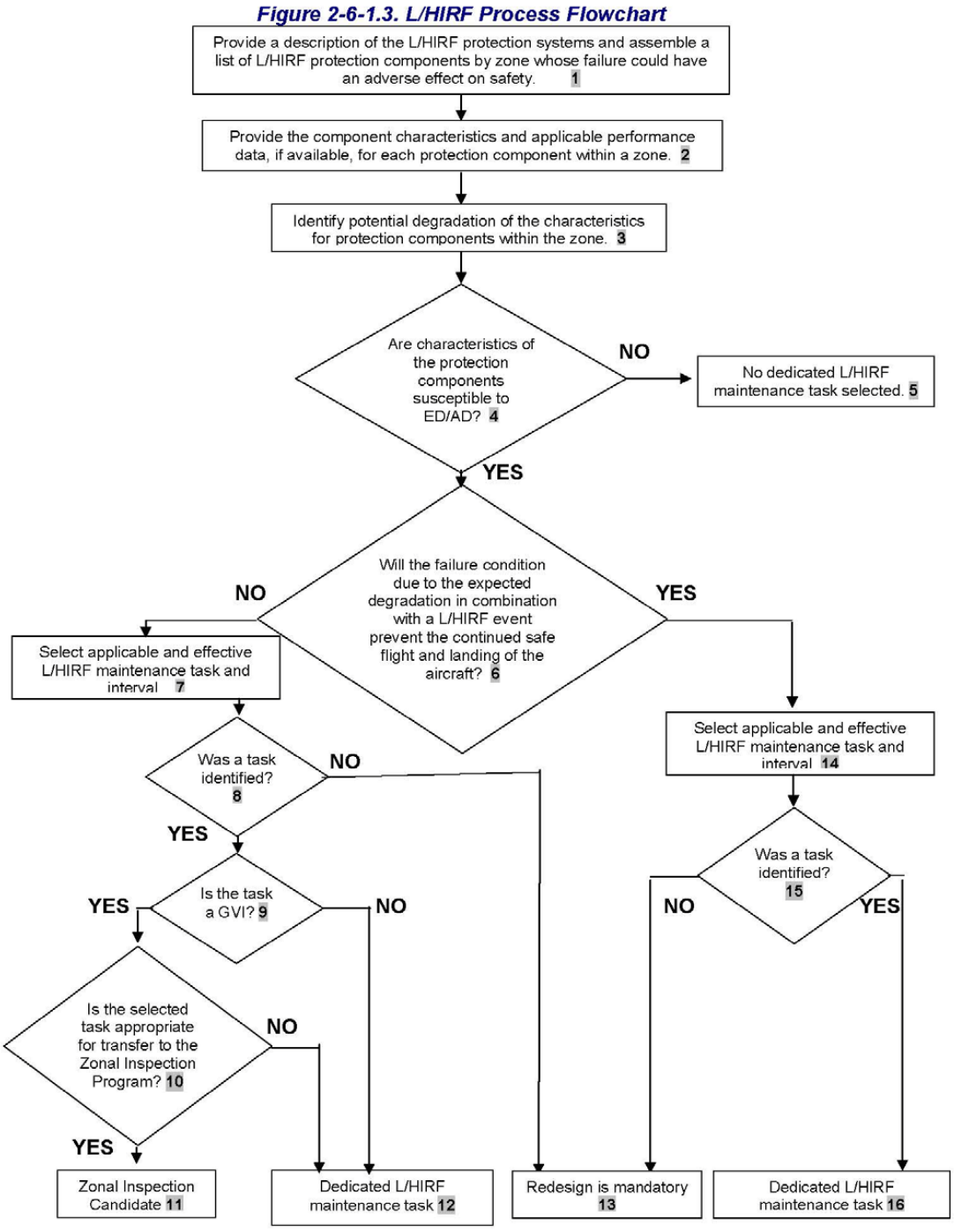
10) Is the selected task appropriate for transfer to the Zonal Inspection Program? Determination of appropriateness uses interval, access, visibility or other means. Refer to Zonal Analysis Procedures section of the MSG-3 document.

11) Zonal Inspection Candidate. (self-explanatory)

12) Dedicated L/HIRF maintenance task. This task is listed as part of the L/HIRF maintenance program.

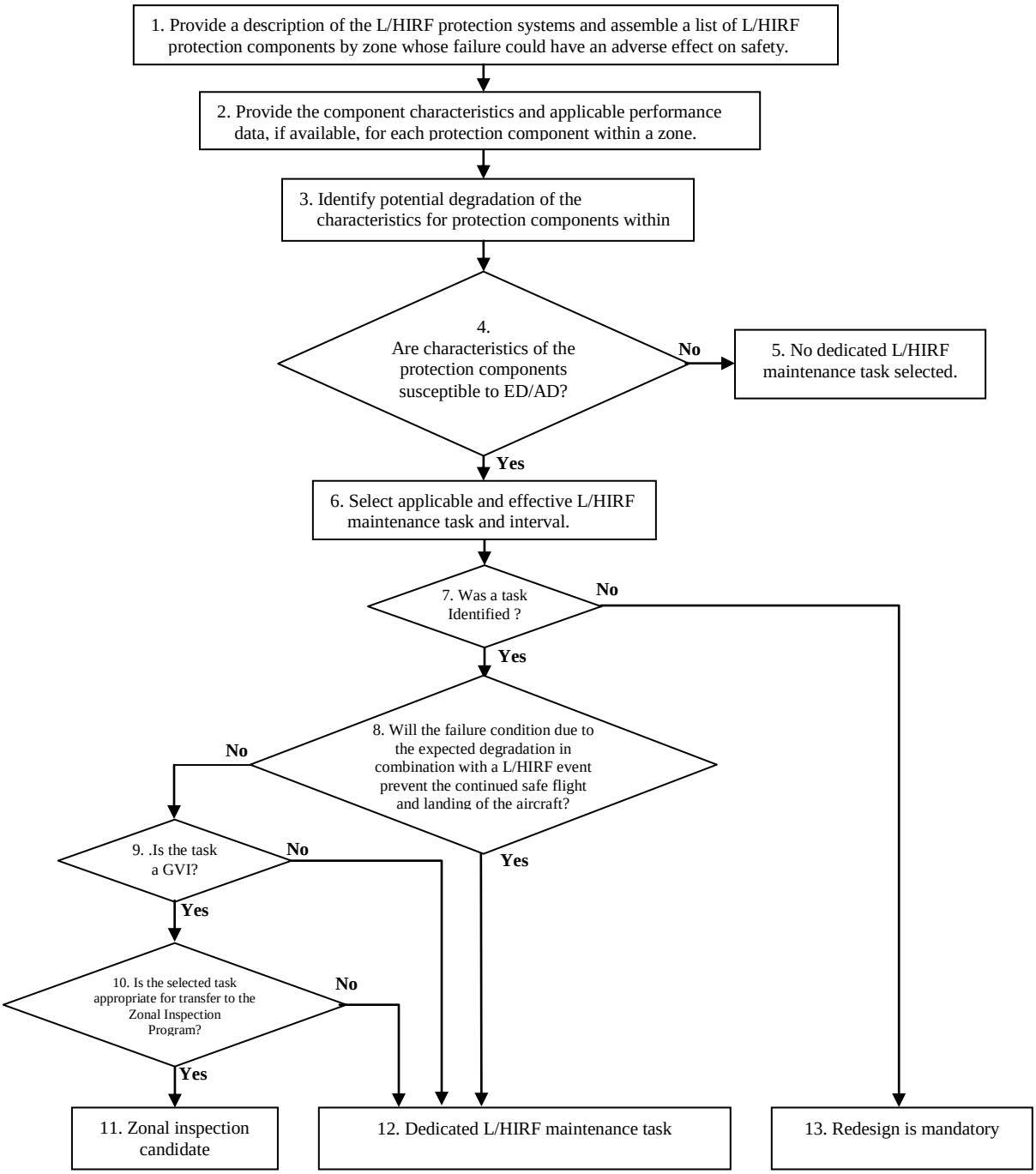
13) Redesign is mandatory. In cases where applicable and effective maintenance cannot be selected to identify the degradation event during a maintenance action, redesign is required.

Figure 2-6-1.3 from MSG-3 Rev 2009



Proposed change to Figure 2-6-1.3

Figure 2-6-1.3. *L/HIRF Process Flowchart*



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IMRBPB Position:
Date: **Position:**

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

Recommendation for 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.