



Issue Paper (IP)

IP Number: 206

Initial Date (DD/MMM/YYYY): 12/May/2023

Revision - Date (DD/MMM/YYYY): Rev. 0 / 12/May/2023

Effective Date (DD/MMM/YYYY): 11/Jul/2023

Retroactivity (Y/N): N

Title:	Analysis/approval only for mature/frozen design
Submitter:	EASA

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

Issue:

MSG-3 often refers to "the design" but is not addressing the maturity of the design or the design status during the MRB process. The IMPS recognizes "the design and development process of the aircraft" but does not address specific issues of changes during that process and the maturity of design for analysis.

In the recent years there was an increasing number of analyses presented to working groups that addressed immature design known not to be the final certified one as design changes were already worked on.

Such practice produces inefficient analysis, which has to be revised/redone once the design is frozen, creating a risk that an MRBR not reflecting the latest type design is approved and published.

Problem:

It is understood that most of the MRB activity is done under time pressure and needs to be finished for entry into service in a process running in parallel to the certification process. This implies that not all design details are final at the time the MSG-3 analysis is performed and design changes can happen at any time until the final type design for certification is frozen, so the MRB process must be flexible enough to cover those. This is especially true for the initial MRBR.

In the recent years there were many occasions, where a design not yet mature was presented to a Working Group, or an MRBR proposal not reflecting the final type design for certification was forwarded to the ISC/MRB for approval, knowing that there were more changes still worked on. This was often not clear to the WG/ISC/MRB and just discovered by accident when harmonizing with the certification panel.

It is accepted that not fully frozen design is already presented to working groups in MSG-3 analysis, if it has already reached a high level of maturity and the details affected by upcoming changes are clearly indicated and tracked, the design status reflected in the document revision is known and there are processes and means in place that makes sure analysis is updated once the final design is frozen.

However, even if not totally frozen, the design presented should be mature enough to spend resources on analysing and accepting it. If major design changes are still anticipated to become



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necessary prior to certification (e.g. because a test has failed, regulation has changed, a weight saving exercise has started or newer technology has become available), the analysis should not be presented yet.

It is especially not acceptable if a design is presented as final and certified to the WG when in fact there are still major modifications pending and the change proposal is not yet finalized.

Note: The terminology of minor/major design changes in the MRB process should not be confused with the one relevant for type certification (effect on the mass, balance, structural strength, reliability, operational characteristics, operational suitability data, or other characteristics affecting the airworthiness of the product) but concentrate on the level of impact on the MSG-3 analysis.

For Systems/Powerplant for example:

- The 4 questions of the MSI selection.
- Function(s), Functional Failure(s), Failure Effect(s) and Failure Causes(s).
- Available redundancy and protective functions.
- Evidence of failures (CAS messages, Power on Self test etc.).
- Technology (e.g. electromechanics vs. solid state).
- Applicability and effectiveness of tasks.
- Reliability figures and task intervals.

For Structures for example:

- Materials.
- Protection scheme.
- Design philosophy (fails safe, waiting fail safe, damage tolerant).
- Drainage provisions.
- Access.

Recommendation (including Implementation):

As the issue is not about the analysis methodology but about the process, no changes to MSG-3 are considered necessary, only the IMPS should be updated:

It is recommended to amend IMPS in order to reflect that:

- MSG-3 analysis should only address mature design.
- MRBR Proposal should only contain tasks for a frozen type design as intended to be certified.
- Any known design immaturity must be highlighted and appropriately tracked.
- Any analysis not yet reflecting final design should be finalized and the resulting tasks published latest with the next regular MRBR revision published after certification of those changes / that type design status.



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For tracking purposes TCH should be free to define means in the PPH which are acceptable to the ISC and MRB, for example:

- Through action items.
- Through specific tracking lists.
- Through assumptions.
- Through internal processes approved by the certifying authority.

Update chapter 4 of the IMPS:

Amend Paragraph 4.2.5:

- 4.2.4** The TCH should arrange for technical support and access to the aircraft, including components thereof and vendor facilities, if required for the development of analysis and tasks.
- 4.2.5** The TCH should during the MRB process provide the ISC/MRB, including appropriate WG members, with details of design changes that will impact the MSG-3 analysis, which may include changes due to potential Airworthiness Limitation Items (ALI) and Candidate Certification Maintenance Requirements (CCMRs).
The TCH should make sure that analysis is reflecting a mature design status and any design changes happening during the MRB process are properly indicated, tracked and finally covered by the MRBR proposal for approval.
- 4.2.6** The TCH should ensure that their manuals contain information and procedures for accomplishing all on-aircraft maintenance tasks covered in the MRBR.

Amend Paragraph 4.4.7 and 4.4.8 :

- 4.4.6** MRB WG advisors will ensure that the WG follows the MSG-3 document and PPH guidelines. Deviations from the MSG-3 document /accepted PPH procedures shall be reported to the MRB chairperson.
- 4.4.7** The WG will review technical data, MSG-3 analysis, and PPH revisions provided by the TCH before each WG meeting, as required. The TCH should provide the data 30 calendar days before each meeting unless the ISC and MRB mutually agree otherwise.
Data and analysis should reflect a mature and clearly indicated design status, design changes during the process have to be tracked and followed up to allow the WG to propose a final set of tasks for the MRBR proposal to the ISC that reflect the final certified design.
- 4.4.8** MRB WG advisors will review WG meeting minutes and provide progress reports to the MRB chairperson after each WG meeting, but no later than the next scheduled ISC meeting. This review will contain an assessment of WG activities, including minimum scheduled tasking/interval requirements, notification of any controversy, potential problem areas, *preliminary analysis of not yet frozen design details*, or issues affecting the application of MSG-3.



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Amend Paragraph 4.6.1 and 4.6.2:

4.6 Maintenance Review Board Report (MRBR) Proposal

- 4.6.1** The TCH prepares the MRBR proposal and forwards it to the ISC Chairperson to confirm it correctly records the WG/ISC agreed results. **The TCH should make sure the MRBR proposal reflects the frozen design status for certification and all changes introduced during the process or since the last MRBR revision are covered.** After ISC acceptance, the TCH formally submits the MRBR proposal to the MRB Chairperson for review and approval, at least 90 calendar days before the expected approval date. The MRB Chairperson will provide MRB comments as early as possible during the review to provide time for corrective action. The MRB Chairperson will coordinate with each VA the expected MRBR approval date and resolve harmonization issues as per the Letter of Confirmation prior to the approval letter being issued, as required.
- 4.6.2** In cases where the ISC has accepted and released a partial package of work, after the **related** design is considered ~~final~~ **frozen** and applicable minimum scheduled tasking/interval requirements have been completed, the TCH may submit these packages to the MRB Chairperson for review. The MRB Chairperson will however only approve the complete proposal when all the packages **reflecting the frozen design** have been received and reviewed.



International MRB Policy Board

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IMRBPB Position:	
Date:	12 May 2023
Position:	Agreed, closed in 2023 meeting as IP 206
Recommendation for Implementation:	As per effective date

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