| | | MRB answers to Embraer (EM) /Airbus (AI) / Boeing (BO) / Bombardier (BA) industry expert comments | Date : 04/04/2008 |
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| Item # | SME | Suggestion | Disposition |
| 1 | EM | 1. Authorities' proposed MRB Report Evolution criteria rely solely in maintenance field data to support MSG-3 Analyses/MRB Reports evolutions/optimization. Embraer considers that those evolutions/optimization can also be generated based on other things such as:<br><br>    - Full Scale Fatigue Test results;<br>    - Modifications / Alteration to the original Type Design;<br>    - Revisions on the original system safety analysis used during original MSG-3 analysis which reflects updates/modifications in the MSG-3 analysis;<br>    - Updates in the original MSG-3 analysis, due to review of assumptions initially made and information available at the time of the analysis (example: Vendors recommendations);<br>    - New regulations requiring new MSG-3 revision level of analysis be preformed ( SFAR 88 FAR 26 etc EZAP etc); | The evolution/optimization exercise is a process for the collection and analysis of operational data in order to optimize current MRBR tasks based on experience. |
| 2 | EM | Embraer's position is based on its large experience using MSG-3 methodology (more successful applications of MSG-3 Methodology in the Industry over the last 15 years) and in text of the ATA MSG-3 methodology (refer to ATA MSG-3 2007.1 document, heading 2-3-8.2. Sources of Information, for example).<br>Therefore, the proposed IP 44 Flow Chart should also reflect these other reasons / justifications for MRB Report evolution / optimization as indicated in the attached file. | MSG-3 is utilized to determine the  tasks and intervals for the initial MRBR but field data will be used for the evolution/optimization of the Report. |
| 3 | EM | 2. For the Authorities' proposed IP 44 criteria related to field data, Embraer has the following considerations: | |
| 4 | EM | **- Engineering Analysis for interval determination (refer to page 23 Authorities' presentation proposal for IP 44) should not be restricted to field data evaluation for    NON-SAFETY related tasks (CATEGORIES 6, 7, and 9, for example) if OEM and WG/ISC members consider that other considerations may apply, such the ones indicated       in item 1 of this e-mail. Field data is an important input for the MRB Process, not the only valid input.** As an example, WG/ISC member may decide that a failure that is now evident due to a new EICAS message (incorporated as a design change) should not be covered by a CATEGORY 9 (Hidden Non-safety) MRB task, as it is not cost-effective anymore. | MSG-3 is utilized to determine the tasks and intervals for the initial MRBR but field data will be used for the evolution/optimization of the Report. |
| 5 | EM | - Instruction such as "Data Format: as deemed acceptable by regulatory authority..." must be | Noted: |

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| | | avoided. It is vague and do not support OEM's to adjust, if necessary, its own process to generate acceptable proposals. If there is any concern on this topic, please explain it better (as a good example, please refer to the Data Quality minimum requirements on page 8 of the IP 44 presentation). | Para. 3.0, 4.3 identifies ATA Spec 2000 (Chapter 11) or equivalent. |
| 6 | EM | - 95% Level of Confidence should be only mandatory for <u>safety related tasks</u>. Lower levels of confidence should be allowed for operational and economic related tasks if accepted by WG/ISC members (Operators and OEMs should decide what amount of uncertainty is acceptable for non-safety related proposals, not the Regulatory Authorities). | It applies to all tasks |
| 7 | EM | 3. Embraer considers important to revise the ATA MSG-3 document section related to MSG-3 analyses revision and interval definition to reflect all the decision made through this IP 44, as an final exercise in order to make sure that any new proposed criteria will fit each individual type of MSG-3 Analysis (Systems & Powerplant, Structures, Zonal, L/HIRF). | IMRBPB does not see any need to change MSG-3 for this process. |
| 8 | EM | 4. Embraer understands that any released 2008 calendar of MRB Process events (sent to all Operators and involved Regulatory Authorities) is equivalent to the "letter of intent/application" indicated in the Authorities' proposal for IP 44. Therefore, Embraer expects that all of its MRB Report evolutions / optimization proposals will be evaluated / treated in 2008 as they were until now (only apply IP 44 new criteria after April 2009). | Concur, If information is included in the calendar. See paragraph 1 of the Introduction section of the Evolution – Optimization Guidelines document |
| 9 | EM | I truly hope that the above comments can be received by the Authorities as a valid contribution to the better use of the MSG-3 methodology and to support our Industry to keep or improve the current safety levels associated with high dispachability and low direct maintenance costs. | Noted and appreciated |
| 10 | EM | Additionally, we are working on a different flow chart from the one currently shown in the IP#44 and we hope to have it done prior to the meeting next week. | Noted. |
| 11 | BA | **Slide # 6**<br>▪Define Historical data tool, it is not referenced any further in document<br>•Need definition in order to comment, or remove as covered by other requirements | ==Detailed in EOG § 4.2 and section 5.== |
| 12 | BA | **Slide #7**<br>▪Slide is more appropriately called Data Content<br>•should list the fields that must be contained in the data | Detailed in § 5.0 of "Evolution/Optimization guidelines "(EOG) |
| 13 | BA | **Slide #7**<br>▪Prefer "Critical elements in Acceptable Format" vs Standardized Format, as each OEM must have same critical fields, but format should be left to each OEM to provide | Changed by " as deemed acceptable by the regulatory authority" in EOG § 4.3 |

| | | acceptable data | |
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| 14 | BA | **Slide # 8, # 9 and # 10**<br>Slide is more appropriately called Data Content Cont'd | Clarified in the final document. |
| 15 | BA | **Slide # 8, # 9 and # 10**<br>Shop findings should be listed "as required" | Clarified "as applicable" in EOG §5.5 |
| 16 | BA | **Slide # 8, # 9 and # 10**<br>1.Operational Representation, how is this a requirement, since each task should have the appropriate parameter selected<br>**•Is this intended to be general statement, that lists program assumptions, if so these should be listed in MRB and not required any further** | Discussed in IP 44 MWG and clarified in EOG §5.8 |
| 17 | BA | **Slide # 8, # 9 and # 10**<br>Consecutive tasking requirement, our interpretation is this should be replaced with Consecutive Times Accomplished | Clarified in EOG § 5.9 |
| 18 | BA | **Slide # 8, # 9 and # 10**<br>Needs definitions for Unscheduled, Unrelated | Definition provided |
| 19 | BA | **Slide # 8, # 9 and # 10**<br>▪Our interpretation for Unscheduled<br>  •Only PIREPs that can be mapped to MRB system task intents<br>   -Not zonal as the intent is too generalized, adds no value, as this intent is captured by   regular reliability monitoring<br>  •Only for same aircraft sampled and same duration, to maintain consistency<br>   -Data purpose is to show how many findings between scheduled checks, so need to keep same data level | Definition provided |
| 20 | BA | **Slide # 8, # 9 and # 10**<br>▪Our interpretation for Unrelated<br>    •Findings not related to the task, but found during the performance of the task | Definition provided |

| 21 | BA | **Slide # 8, # 9 and # 10**<br>▪Modification Status<br>  •Should not contain AOM and SL as these are information sources and do not impose design changes<br>  •Should not contain AD, as is not task effectivity and must have a closing action<br>  •Recommend limiting this to MRB tasks that list an effectivity<br>   -Each OEM responsible to review all design changes and determine MRB task impact (configuration management/living MRB)<br>    -This ongoing process determines if an Mod/SB needs to be considered against a particular task (effectivity applied)<br>    -If task has effectivity (Mod/SB), then pre and post data required to evolve either | Clarified in EOG § 7.4 |
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| 22 | BA | **Slide # 8, # 9 and # 10**<br>▪Recommend changing 4 digit ATA code to "At least 3 digit ATA code" to meet industry standard | Clarified through "To the extent possible" in EOG § 5.13 |
| 23 | BA | **Slide # 8, # 9 and # 10**<br>▪Removals and Failures<br>  •Clarification of what is meant by removals and failures?<br>  •Our interpretation is, this is covered under scheduled and unscheduled findings | Clarified in EOG § 5.5 |
| 24 | BA | **Slide # 8, # 9 and # 10,**<br>▪What are we transferring and to what?<br>  •**This is the first mention of related significant findings, are these the same as scheduled maintenance findings?**<br>  •**Need to define if these are different.**<br>▪Our interpretation is, this is covered by the Unscheduled, scheduled and unrelated requirements of this section | Clarified in EOG § 5.12 |
| 25 | BA | **Slide # 11**<br>▪Under "Data validation" change words to<br>  •Ensure all required fields are entered correctly<br>  •If any required element is missing, OEM/TCH required to obtain | Clarified in EOG § 6.1<br>OEM recommendations adopted |
| 26 | BA | **Slide # 11**<br>▪Analysis Schedule<br>  •Our interpretation recommends removal, as not part of data integrity<br>   -Some OEM may plan from beginning, some will do ad hoc, when enough data available | Clarified in EOG § 7.1 |

| 27 | BA | **Slide # 11**<br>▪Task Mapping (add the following)<br>　•Unscheduled tasks mapped to MRBR tasks should only be for same aircraft sampled and same duration, in order to keep consistency of data | Clarified in EOG § 5.6 |
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| 28 | BA | **Slide # 12**<br>▪Define Scheduled Maintenance Performance, this is a new term, not sure what this measures<br>　•Is this maintenance performance (i.e. FRACAS), if so, this is not related to scheduled maintenance<br>　•Our interpretation is this health monitoring, after evolution?<br>　　-Which is a method to show a change in scheduled maintenance, has no adverse effect on reliability | Clarified in EOG §7.2, word "schedule maintenance performance" removed and replace by level of confidence. |
| 29 | BA | **Slide # 13**<br>▪Recommend first paragraph change:<br>　•Engineering analysis will verify that scheduled and unscheduled findings are related to MRB tasks and evaluate the significance or severity of the findings<br>　　-Unscheduled and scheduled previously defined<br>▪Recommend deletion of second bullet as it is covered in the new first | Clarified in EOG § 7.3 |
| 30 | BA | **Slide # 15**<br>▪Our interpretation recommends changing first paragraph to:<br>　•OEM/TCH in selecting fleet sample should consider<br>　　-Geographic Region, Fleet Utilization, Operator Fleet Size and Aircraft Age<br>　•Bombardier supports that operator selection and data quantity should be selected separately<br>　　-Confidence level is not required for operator selection, this should be based on meeting criteria<br>　　-Example: We could get 100% operator participation for all aircraft (= 100% confidence), but if no higher task interval has been accomplished no evolution possible<br>　　-We support that the quantity should have 95%, but be accomplished on a task-by-task basis<br>▪NOTE: should add words "on a task-by-task basis" | Agreed and EOG modified to reflect task by task basis. |

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| 31 | BA | **Slide # 16**<br>▪Our interpretation recommends combining the two paragraphs as follows:<br>  •The OEM/TCH will provide, using a statistical tool, justification that the sample size of the world fleet meets the 95% confidence on a task-by-task basis | Clarified in EOG § 3 and 7 |
| 32 | BA | **Slide # 17 and #18**<br>▪Confidence Factor should be removed as it is covered on previous two slides | See final EOG |
| 33 | BA | **Slide # 17 and #18**<br>▪Modification Status<br>•Should not contain AOM and SL as these are information sources and do not impose design changes<br>•Should not contain AD, as is not task effectivity and must have a closing action<br>•Our interpretation recommends limiting this to MRB tasks that list an effectivity<br>  -Each OEM responsible to review all design changes and determine MRB task impact (configuration management/living MRB)<br>  -This ongoing process determines if an Mod/SB needs to be considered against a particular task (effectivity applied)<br>  -If task has effectivity (Mod/SB), then pre and post data required to evolve either | AOM removed see final EOG |
| 34 | BA | **Slide # 17 and #18**<br>▪Root cause Analysis tool, our interpretation recommends changing to:<br>  •Trend Analysis process for reviewing require scheduled and unscheduled findings trends<br>    -This process to include review of findings significance and severity and how trend finding is being addressed | Root cause no longer used in final EOG. |
| 35 | BA | **Slide # 19**<br>▪MTBUR and MTBF<br>  •**First mention of this statistical data, what is the intention, should not be mandatory, as was not listed as a required data field** | Clarified in EOG § 8 |
| 36 | BA | **Slide # 19**<br>▪PIREPs and Non-Routines<br>  •**Not required as already addressed on previous slides** | Noted |

| 37 | BA | **Slide # 19**<br>▪Technical Follow-up on Open Issues<br>  •**These are individual actions identified during an evolution process and should be controlled as such through PPH** | Agreed |
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| 38 | BA | **Slide # 19**<br>Our interpretation recommends this slide be removed, second bullet addressed next slide | Slide no longer used |
| 39 | BA | **Slide # 19**<br>▪This implies that a part of evolution requires MSG-3 analysis updating after evolution<br>  •Evolution analysis and statistical tools, are all separate from standard MSG-3 analysis<br>  •Therefore all decisions related to evolution (de-escalation, deletion etc..) are made outside of MSG-3 logic based on in-service data<br>  •There is no intrinsic value to back-driving this information into the original MSG-3 analysis<br>  •Certification documentation is not updated when there is a modification, there is an amendment added<br>Our interpretation recommends stating "Linkage/amendment required between Evolution report and MSG-3 data package", should be added next slide | Clarified in EOG § 8.1 and agreed during the 2nd MWG |
| 40 | BA | **Slide # 20**<br>▪Deletions/Additions agreed; modification needs some clarification<br>  •If intention is to update all changed intervals, there is no intrinsic value to this exercise<br>    -Should require there be linkage/amendment between Evolution documentation and MSG-3 data package only<br>  •If intention is to update functionality based on Modifications, this is done on an ongoing basis (configuration management/Living MRB) as per each OEM/TCH PPH<br>  •Our interpretation recommends removing reference to modification, as additions and deletions and PPHs address<br>▪New/Revised should state "Amendment to MSG-3 Analysis" | Clarified in EOG § 8.1 and agreed during the 2nd MWG |
| 41 | BA | **Slide # 21**<br>▪Recorded and traceable in the associated MSG-3 Analysis<br>  •Recommend changing to:<br>    -Recorded in documentation with linkage/amendment to MSG-3 data package | Clarified in EOG § 8.1 and agreed during the 2nd MWG |

| 42 | BA | **Slide # 21**<br>▪For some products MSG-3 analysis was handwritten, other is developmental databases, some in labour intensive databases with no commensurate improvement in the decision making process<br>▪These are products with enough in-service time to support evolution | Clarified in EOG § 8.1 and agreed during the 2nd MWG |
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| 43 | BA | **Slide # 21**<br>▪Updating MSG-3 analysis to back-drive decisions made in other documentation that can be linked/amendment to MSG-3 adds no decision making value | Clarified in EOG § 8.1 and agreed during the 2nd MWG |
| 44 | BO | 1. Implementation<br>    a. The industry will need a grace period for implementation. We need to identify achievable implementation date. | Clarified in EOG § 1.0 |
| 45 | BO | 1. Implementation<br>    b. In the interim, current process, as reflected in the respective fleet PPH, should be continued for MRB evolution | Agreed |
| 46 | BO | 1. Implementation<br>    c. FAA memo dated January 31, 2007 should be retracted. | To be addressed by FAA, as it is an FAA decision. |
| 47 | BO | 2. 95% Confidence level requirement<br>    a. We assume that confidence level is related to operator data quantity. However, it should be noted that operator data is only one part of the input. OEM engineering data (design spec, test data, in-service reports, etc…) may influence the decision. IP-44 should provide the flexibility to use engineering judgment as part of the MRB evolution process. | Clarified in EOG § 3.0 |
| 48 | BO |     b. We agree that there should be an industry wide standard for quantitative (or statistical) analysis. However, the 95% confidence level requirement should be evaluated to make sure that it is realistic…and its applicability should be limited to safety related tasks. | Reviewed and discussed during the 2nd MWG.<br>See item 6<br>Clarified in EOG § 7.2 |

| 49 | BO | c. Economic task evolution should be determined by the ISC/MRB based on the adjustment being considered and the justification at hand (based on qualitative and/or quantitative analysis). | See item 6 Clarified in EOG § 7.2 |
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| 50 | BO | 3. Data requirement – content, quality, format | |
| 51 | BO | a. Operator data requirement may not be achievable for out-of production fleets. OEM engineering data and engineering judgment should be used to complement the decision making process. (refer 2.a above) | Clarified in EOG § 7.2 |
| 52 | BO | b. OEM responsibility to data quality, integrity, and audit requirement needs further clarification. | Clarification provided see final document |
| 53 | BO | c. Shop data requirement should be limited to "shop restoration" tasks. Should be optional for other MRB tasks. | Clarified in EOG § 5.5 |
| 54 | BO | d. Consecutive check data requirement should be limited to lower checks. It is difficult or impractical to collect consecutive check data for higher checks (C-Check and above) | Clarified in EOG § 5.9 |
| 55 | BO | e. Unscheduled maintenance data may be important (particularly for "evident" tasks). However, for most operators, it is difficult to collect and submit line maintenance data in a standard format. IP-44 should give an option for operators to bring their line experience and knowledge to the WG meetings. | Clarified in EOG § 5.10 |
| 56 | BO | f. Analysis schedule – needs clarification | Clarified in EOG § 7.1 |
| 57 | BO | g. Data correlation – needs clarification | Clarified in EOG § 8.0 |
| 58 | AB | 1) The proposed methodology forms a good summation of the many factors that should be taken into account when considering an evolution. However, we highlight that the analysis of in-service data constitutes only part of the justification for new/revised tasks and intervals. It is important not to put too much emphasis on this data at the expense of good engineering judgement supported by engineering analysis, vendor recommendations, rig tests, endurance tests etc. | Clarified in EOG § 7.3 |
| 59 | AB | 2) It should be understood that analysis of findings / nil-findings received from operators does not help in the evolution of several types of MRBR task. For example, no findings would be expected from lubrication, servicing, restoration or discard tasks. Absence of findings clearly does not constitute justification for escalation. | Clarified in EOG § 7.3 |

| 60 | AB | 3) While results from failure finding tasks (OPC and VC) are well suited to statistical analysis, the same is not necessarily true for those looking for deterioration (FNC, GVI, DET) since the extent of the degradation is critical to the evolution decision and this is often inadequately recorded. Similarly, statistical analysis of Zonal Inspection results is invalid since, unlike failure finding tasks, it is quite normal for many items to be noted as in 'less than perfect' condition. Reporting standards vary enormously and thus evolution must focus on an engineering assessment of reported findings to determine whether there are any systematic findings that warrant creation of a dedicated task in order to permit an escalation of the zonal interval. | Clarified in EOG § 7.3 |
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| 61 | AB | 4) Due to the limitations on statistical analysis mentioned in (2) and (3), we urge the MRB not to focus too closely on hard criteria. It would be preferable to emphasise the range of issues that need to be taken into consideration. The use of some form of matrix to guide WG discussion on the confidence that can be attributed to different sets of data is valuable and provides direction. However, we are becoming increasingly concerned that too much attention is being given to the mathematical result – it should be seen as another input into the discussion but not a decision making tool to determine whether the proposed evolution is appropriate. | Clarified in EOG section 7 |
| 62 | AB | 5) One of our primary concerns with the proposal relates to the '95% confidence' requirement. The MRB Process has, up to now, avoided the need for formulae, any mathematical analysis being limited to certification related safety analyses. The need for this approach will require new competences in the MWGs and thus additional training. To ensure a harmonised approach across all TCHs, it will be necessary to identify the formula that is expected to be used to show 95% confidence. Until this is available and can be tested, it is not possible to declare whether its use is justified in preference to a judgement based on the MWGs perception of the value of the acquired data. Furthermore, while the 95% figure might be achieved with respect to data quantity, it says little about the data quality. | Clarified during the 2$^{nd}$ WG. |
| 63 | AB | 6) It is necessary to recognise that the proposed method must be suitable for evolution of all MRB Reports and not only those of in-production aircraft with strong customer bases. Not all operators are able to provide data in either the quantity or quality that is requested. They may also have limitations on what format they provide it. It is however important for the TCH to get what data it can to support the evolution. A deficiency in the data from operators should not necessary mean that the evolution exercise cannot proceed. | Clarified in final document and during 2$^{nd}$ WG |
| 64 | AB | Slide 2<br>a) It is noted that the framework is provided as guidance. This is an important statement since it provides some flexibility for MRBs to permit deviation from its strict application. The methodology should be understood to identify the various issues that ideally need to be covered. OEMs/TCHs should be required to formally consider each of these issues but, with MRB agreement, may continue with an evolution / optimisation exercise even if compliance with one or more issue is either not possible or deemed to be impractical. | Discussed and clarified during the 2$^{nd}$ WG |

| 65 | AB | Slide 2 <br><br> b) It is understood that the 'effective date' of any new policy will be discussed in Ottawa. It is noted that the objective refers to Apr 2009. Airbus would support a statement from the IMRBPB that OEMs/TCHs have 12 months from the date of IP44 closure to reflect the new methodology in any MRBR revision submitted to the MRB for approval. IP44 closure requires agreement between Industry (essentially MPIG) and the IMRBPB. The objective is to reach agreement in Cologne. If this is achieved then MRBRs submitted to an MRB from May 1st 2009 must be compliant. | Clarified in EOG § 1.0 |
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| 66 | AB | Slide 3 <br><br> a) The order of box two and three is accepted but as we move towards a more consistent data retrieval system between OEMs and operators it is expected that data collection will become independent of targeted MRBR evolution exercises. In this situation, the PPH/ISC will determine objectives and then ask the OEM to review the existing data. Any perceived weaknesses might need to be addressed by a specific request but in most cases the 'data collection' will come before the box two. | Clarified in final EOG |
| 67 | AB | Slide 4 <br><br> a) Intent of first bullet is understood to relate to a targeted evolution of groups of tasks within the MRBR. All MRBR revisions will include some task evolution. | Agreed |
| 68 | AB | Slide 4 <br><br> b) The concept of Application letters has been driven by EASA and is primarily for resource / finance reasons. Is it now intended that letters must be sent to all MRB signatories? Do all OEMs have to get the same set of signatures? (assuming that their aircraft will be operated under each MRBs jurisdiction – question understood to be unrelated to IP44). | Clarified during the 2nd WG and in the final document. |
| | AB | Slide 5 <br><br> a) What are the 'policy requirements' (as opposed to recommendations/objectives) that relate to evolution / optimisation? | Clarified in EOG § 3.0 |

| 69 | AB | Slide 5<br><br>b) What is meant by 'Incorporated by Reference'? If a referenced document is updated, the PPH should only be updated to reflect the latest revision <u>if</u> this latest revision is declared as valid for that particular MRBR evolution. In most cases the referenced document will be generic and used by the OEM for all programs. However, different revision standards will be applicable to different programs (eg A320 uses Rev 5 and A380 uses Rev 6). The A320 PPH should only be updated to reflect Rev 6 if all the MSG-3 dossiers are updated as well. The requirement should simply be that the PPH must provide the reference and issue number of other documents used in the development of the MRBR revision. | Clarified in EOG § 4.1 |
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| 70 | AB | Slide 6<br><br>a) The word 'must' is strong. Could you accept 'should'? | rejected |
| 71 | AB | Slide 6<br>b) Clarification of the difference between 'data quality' and 'data integrity' is needed. | Clarified in EOG § 5.0 and 6.0 |
| 72 | AB | Slide 6<br>c) What is meant by 'audit system'? Does this mean that we have to implement a system that allows the MRB to audit us, or does it mean that we have to implement a system that allows us to audit the Airlines that provides us with data? This needs to be clarified. | Clarified during the 2<sup>nd</sup> WG. Both OEM and RA should be able to trace data through the original source. |
| 73 | AB | Slide 6<br>d) All data must be in a format to allow it to be traced to its original source but what is meant by a format that can be 'audited'? | Clarified in EOG § 4.3 and 6.2 |
| 74 | AB | Slide 7<br><br>a) As mentioned earlier, clarification needed on difference between data 'quality' and 'integrity'. | Clarified in EOG § 5.0 and 6.0 |
| 75 | AB | Slide 7<br>b) What is meant by 'clean' data? We presume this means translated into English with non-standard abbreviations removed. Does it also allow for deletion of irrelevant or non applicable data? | Clarified in EOG § 5.11 |
| 76 | AB | Slide 8<br><br>a) 'Number of Checks'. Do you mean 'Number of check package accomplishments' or 'Number of times each task is accomplished'? | Clarified in EOG § 5.3 |

| 77 | AB | Slide 8<br><br>b) 'Interval of Tasks findings applied'. Do you mean 'Actual interval between consecutive scheduled task accomplishments'? How does this relate to findings? | Clarified in EOG § 5.4 |
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| 78 | AB | Slide 8<br>c) 'Shop findings'. What is intended here? Some people believe this relates to MRBR tasks that require removal for workshop check. Others believe it refers to workshop findings related to equipment removed further to a finding during an on-aircraft MRBR task. If the former is intended, we agree. If the latter, then this should not be part of minimum requirement. We agree that if they are available they should be taken into account. However, they are difficult to obtain and even more difficult to correlate with the on-aircraft task. Operator concern is simply to get the component repaired and back on shelf. Unless there is a systematic problem, additional cost of report is not justified (there is no requirement for operators to obtain workshop reports detailing exact failure mode). | Clarified in EOG § 5.5 |
| 79 | AB | Slide 8<br>d) 'Failure effect category considerations'. This is a separate subject unless the intention is simply to record the FEC of the task that led to the finding (if yes, then delete the word 'considerations'). FEC considerations should be taken into account but not at the level of 'Data Quality'. These should be part of the overall assessment that combines the TCH's engineering review and the in-service experience. | Clarified in EOG § 5.7 |
| 80 | AB | Slide 9<br><br>a) Consecutive tasking requirements. The objectives of this requirement need more explanation. It is reasonable to ask for this for typical A/A multiple tasks. It is usually possible for C-chk tasks but it gets difficult for 2C tasks and is impractical for 4C tasks. The original intent was to address MRB concern that an operator may fail to submit details of the one time they experienced a finding – it was primarily a 'trust' issue. With more automatic reporting it is less easy to pull out findings and suppress them. In addition, even with reporting of consecutive accomplishments, it is not possible to see how many times the task was performed for unscheduled reasons between scheduled accomplishments. A finding could just as easily be found during unscheduled task but in these cases it is very difficult to 'map' it to an MRBR task. | Clarified in EOG § 5.9 |
| 81 | AB | Slide 9<br><br>b) Unscheduled maintenance findings. Today, these are not part of formal data reporting between operator and TCH. TCH will be made aware only if failures are causing a significant operational or cost issue. In these cases the failures will be subject to engineering assessment, possible | Clarified in EOG § 5.10 |

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| | | TCH/Cert Office discussion and potentially Mod SB / Inspection SB or SL action. We suggest that unscheduled maintenance findings should NOT be a required part of 'minimum qualifying data' but we agree that operator members should bring knowledge of such findings into the WG discussion. This is of particular importance when considering the evolution of FEC 8 and 9 tasks where the justification relies more on the occurrence rate of the combined 'evident' failure/event than the findings/nil findings of the MRBR task itself. | |
| 82 | AB | Slide 9<br><br>c) Unrelated significant findings. Unrelated to what? If a significant finding is reported during an MRBR task accomplishment that is not related to the MRBR task then it either needs to be 'mapped' to another MRBR task or it constitutes an unscheduled maintenance finding (both of which are already addressed). Clarification requested. | Clarified in EOG § 5.12 |
| 83 | AB | Slide 10<br><br>a) Modification status. Clarification requested. Airbus MRBR task effectivity is mod dependant and thus reported findings at task level will automatically take mod status into account. This seems to address the requirement. However, there may be many mods that have been considered as insignificant to MSG-3 conclusions and thus the selected task is applicable to 'all'. Does the MRB now ask that the reported findings be investigated to determine whether any of these mods does in fact have an influence on reliability? While correct in theory, this is considered idealistic and is impractical on a systematic basis. | Clarified in EOG § 7.4 |
| 84 | AB | Slide 10<br><br>b) Removals and failures. Unclear what is meant by this. Component removals may be performed for several reasons, not only because of failure (e.g. mod embodiment, trouble shooting, cosmetic repair). Some of this information is available in MTBUR data but it is not very helpful for evolution activity. Evolution activity will focus on findings. Scheduled task 'Nil findings' are important but we question why removals for 'non failure' reasons need to be part of minimum qualifying data. If 'removals' are deleted, what 'failures' are not already covered by the 'scheduled and unscheduled' findings on Slide 9? | Clarified in EOG § 5.5 |
| 85 | AB | Slide 10<br><br>c) Transfer of unrelated significant findings is understood. We do not however understand the requirement to transfer related significant findings. Transfer to where? Do the MRB refer to Zonal Tasks where the same significant finding might also have been found during an MRBR Systems task? Thus, while related to Zonal it is also related to the Systems task. Should one finding be counted twice? (Airbus only counts a finding once against the most relevant task). | Clarified in EOG § 5.13 |
| 86 | AB | Slide 11<br><br>a) What is meant by 'data validation'? The TCH needs to determine whether the total data package | Clarified in EOG § 6.1 |

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| | | acquired is sufficient to address all the required factors – is this validation? The assessment as to whether individual findings / nil findings data meet the required factors would seem to be part of data quality, not validation (e.g. if the FH/FC are not reported this is a quality issue). In addition, we need clarification on what is expected from a 'data validation system' | |
| 87 | AB | Slide 11<br><br>b) Analysis Schedule. What timeline is referred to here? Is it the time given to operators to provide data, the period over which data must be taken or something else? What has this got to do with Data Integrity? Is the 'validation timeline' the schedule from receipt of the last set of data to determination that the acquired data package is sufficient to allow MWG activity to begin? | Clarified in EOG § 7.1 |
| 88 | AB | Slide 11<br><br>c) Task mapping. Scheduled maintenance events (or findings?) will be mapped to MRBR tasks where they result from MRBR tasks. Presumably we are not expected to map other findings to MRBR tasks. These other findings (eg from non MRBR tasks) might indicate a need for additional MRBR tasks. See comments against Slide 9(b) concerning need to map findings from unscheduled maintenance. | Clarified in EOG § 5.6 and comment agreed |
| 89 | AB | Slide 12<br><br>a) Clarification needed. What is meant by the 'scheduled maintenance performance'? What are 'normal parameters'? Until we have a better concept of what is expected from the TCH it is difficult to declare that the required system it is feasible. The statistical analysis will be used to demonstrate the adequacy of the data to support the decision making process on whether evolution is appropriate. More discussion is required on this. | Clarified in EOG §7.2, word "schedule maintenance performance" and normal parameters removed and replace by level of confidence. |
| 90 | AB | Slide 13<br><br>a) There is risk of confusion between the 'engineering analysis' of the data (as discussed here) and the engineering analysis performed by the TCH, i.e. the technical assessment of the proposed task evolution in conjunction with safety analyses, SBs, SLs, ADs, TFUs, discussion with Design Office, Customer Services, Field reps etc – which is all in addition to feedback from operators. The results of the assessment of data provided by operators will be only part of the overall evolution exercise. Other factors may influence the decision. | Clarified during the 2nd WG. |
| 91 | AB | Slide 13<br><br>b) The reference to 'no-routine write-ups' causes us some concern. By non-routine we assume you mean findings not related to a scheduled task. Most of these are discovered on the line. Most scheduled tasks are performed during base maintenance and it is from base maintenance that data is generally acquired. Findings from line maintenance are much more difficult to obtain and will | Clarified during the 2nd MWG see EOG § 7.3 and 5.10 |

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| | | always be regarded as 'snap-shot' information for which statistical analysis is invalid. Reports of such findings are most likely to be provided when they result in systematic operational delays or high cost repairs. TCH engineering specialists generally follow both of these and would be part of the TCH engineering analysis mentioned in (a). | |
| 92 | AB | Slide 13<br><br>c) The need to analyse PIREPS, non-routines and component reliability reports is understood but more discussion is needed on how this shall be done. This requirement could result in such an onerous task that no TCH would contemplate an evolution. Care must be taken that ideal objectives do not prevent evolution activities being launched with the consequent continuation of what may be an inappropriate set of tasks. It may be sufficient to highlight that operators attending WG meetings should be familiar with the typical line issues that they have regularly had to address (these generally result from PIREPS and result in non-routine actions). Formal provision of such data in written format is 'nice to have' but should not be critical to the evolution exercise. | Clarified during the 2nd WG |
| 93 | AB | Slide 14<br><br>a) It is agreed that TCHs must conduct MRBR activity (including evolutions) according to an internally approved process. However, it is not clear what the MRB mean by an 'internal approval process'. It would be an onerous requirement to ask that every piece of data received from an operator has to be approved by a second person after the first has 'translated' it into an adequate quality. More info needed on regulatory concern to see how this requirement could best be addressed. | Clarified in EOG section 6 and § 7.5. |
| 94 | AB | Slide 15<br><br>a) 95% level of confidence in what? Should this be '95% margin of error'? What needs to be measured? Is it purely related to the quantity of data or is data quality an issue as well? We need examples and formulae since different source references provide quite different ideas on this. If this is not established there will be differences between TCH methods. Ultimately it is questioned whether this is an ideal that in practice will be open to discussion and subsequent identification of overriding factors. Do the MRB have an idea of the amount of data required to achieve their 95% requirement? Is this realistic considering that it needs to be applied to tasks with intervals varying between 24hrs elapsed and 12yrs/40000FH with some tasks applicable to only a very small number of aircraft. If taken too literally, this requirement could again lead TCHs to refrain from evolution exercises. | Clarified during the 2nd WG and in EOG § 3.0 and appendix. |

| 95 | AB | Slide 16<br><br>a) It is understood that the 'following criteria' are those listed on Slide 17. If indeed the 95% level of confidence is assessed as realistic, then we would prefer that the <u>objective</u> is to provide justification that this level of confidence has been achieved and, in cases where it has not, open discussion with the regulatory concerning whether an appropriate level has been reached for that particular task. | 95% address the <u>quantity</u> at the task by task level the <u>criteria</u> the "quality" of data. Exceptions to 95% are addressed under § 7.2 |
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| 96 | AB | Slide 17<br><br>a) What is meant by an appropriate <u>distribution</u> of 'confidence factor, mod status, age, geographical representation, number of checks etc'? Does this apply only to age and geography? | Criteria listed in EOG section 5 |
| 97 | AB | Slide 17<br><br>b) Comments on Mod Status given against Slide 10(a). | Clarified in EOG § 7.4 |
| 98 | AB | Slide 17<br><br>c) It is welcome to note that 'appropriate' has not been defined and thus there can be some discussion between MRB and the ISC concerning the sufficiency of the available data. We suggest that 'climatic' may be more appropriate than 'geographical' representation. | Clarified in EOG § 5.2 (operating environment used) |
| 99 | AB | Slide 17<br>d) On the need for the applicant to demonstrate the availability of a 'route (root) cause analysis tool'. What is expected here? Application may be impractical for most findings though such a study could be launched in specific situations. Since only the 'availability' must be demonstrated (and not its use), could this requirement be satisfied by another TCH procedure such as Airworthiness Review Monitoring that would need to examine root causes in the determination of corrective action. | Not applicable in the final document |
| 100 | AB | Slide 17<br><br>e) We have some concern on how 'operational representation' will be considered appropriate or not. Presumably this considers operations over the full FH/FC/Cal envelope for which the MRBR is applicable and takes into account all the different types of operation that might affect the task interval (high density seating, long/short range, tanking, flexible t/o, ETOPS, Cat 3, RVSM etc. | Clarified in EOG § 5.8 and during the meeting |

| 101 | AB | Slide 19 <br><br> a) Not clear what is intended by this single page titled 'Data Correlation'. The reference to MTBUR and MTBF is not understood. It is not possible to relate these to failure causes – they are simply an indication of the overall reliability of the component. MSG-3 and safety assessment require details of failures causes/modes within the component. Is this a new requirement for the TCH to compare actual values with those anticipated at time of initial MSG-3 analysis? This would seem to be excessive considering that this information plays a relatively small part in task interval determination. | Clarified in EOG section 8 |
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| 102 | AB | Slide 21 <br><br> a) We agree that any decision together with justification shall be recorded and traceable but how this is done should be left to the individual TCH. This could impose a significant change to MSG-3 analysis software. The option of recording this information in Minutes of Meeting or other documents should be permitted. If not, then timeline to implement changes to dossiers must be much longer than the Apr 2009 date suggested. | Clarified in EOG § 8.1 and agreed during the 2$^{nd}$ MWG See item 41 |
| 103 | AB | Slide 22 <br><br> a) Though the term 'Potential Failure to Failure interval' was extensively discussed with the IMRBPB when Henry DYCK / John MOUBRAY were proposing changes to MSG-3, the term has not yet been included and is thus not familiar to most readers. Explanation will be required | MSG 3 now includes this term. Clarified in EOG § 8.1 and agreed during the 2$^{nd}$ MWG |
| 104 | AB | Slide 22 <br><br> b) Comments on consecutive checks are given against Slide 9(a). | Clarified in EOG § 5.9 |
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