

International Maintenance Review Board Policy Board (IMRBPB)
Issue Paper (IP)

Initial Date: 24/02/2014

IP Number: IP 139

Revision / Date (DD/MM/YYYY):

Title: Update of Rating Tables – Surface protection systems and Material rating

Submitter: EASA

Applies To:	
Vol 1:	
Vol 2:	
Both:	X

Issue: TCHs are evaluating the surface protection in the MSG3 based on “so-called” Protection rating table. This protection rating table is usually provided by the OEM engineering and assess the level of protection via a rating system vs. protections applied on the bare material.

Problem: It has been noticed that the protection rating table used in the development of different programs for a same OEM over the years remain the same. With the evolution of the technology and design improvements, it leads to the incapacity to create a difference in the level of surface protection in a MSG3 analysis. Same remark applied to all rating tables, for example the corrosion rating of the bare materials.

MSG is supposed to address economic aspect as well as safety issue by selecting the optimum interval . An inadequate low interval , is not necessarily a conservative one. Keeping the current table would lead to absence of finding at the first inspection and major findings at the second one. Here safety may be impacted by performing the inspection too early.
It may also impact the reliability program result of the operator.

Example of Rating tables:

OEM 1: Ratings remain the same for 20 Yrs despite development of several different programs

ALUMINIUM ALLOYS

ALOCROM => **AVERAGE**

ALOCROM + PRIMER => **GOOD**

ALOCROM + PRIMER + TOP COAT => **GOOD**

CAA/TSA+ PRIMER => **SPECIAL ATTENTION**

CAA/TSA + PRIMER + TOP COAT => **SPECIAL ATTENTION**

SAA + PRIMER + TOP COAT => **SPECIAL ATTENTION**

SAA + LUBRICANT => **SPECIAL ATTENTION**

HARD SAA => **SPECIAL ATTENTION**

OEM 2: Ratings remain the same for 20 Yrs despite development of several different programs

ALUMINUM ALLOYS (1: Average, 2: Good, 3: Special Attention)

None None A002 1

Conversion Coating (conductive) FR Primer + Polyurethane topcoat A008 3

Conversion Coating (conductive) FR Primer A009 2

Conversion Coating FR Primer A010 2

Conversion Coating FR Primer (2 coats) A011 3

Sulphuric Anodize FR Primer A012 3

Sulphuric Anodize FR Primer (2 coats) A013 3

IP Template Rev 2, dated 22/02/2007

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Chromic Anodize FR Primer A014 **3**

Chromic Anodize FR Primer (2 coats) A015 **3**

Conversion Coating FR Primer+ Polyurethane Topcoat A016 **3**

Sulphuric Anodize FR Primer+ Polyurethane Topcoat A017 **3**

Chromic Anodize FR Primer+ Polyurethane Topcoat A018 **3**

Conversion Coating Fuel Tank Coating A019 **3**

Sulphuric Anodize Fuel Tank Coating A020 **3**

Chromic Anodize Fuel Tank Coating A021 **3**

Conversion Coating (conductive) Fuel Tank Coating A022 **3**

Conversion Coating FR Primer+ Polyurethane Topcoat A023 **3**

Sulphuric Anodize FR Primer+ Polyurethane Topcoat A024 **3**

Chromic Anodize FR Primer+ Polyurethane Topcoat A025 **3**

Conversion Coating (conductive,colorless) FR Primer A026 **2**

Conversion Coating (conductive,colorless) FR Primer (2 coats) A027 **3**

Conversion Coating FR Primer A028 **2**

Conversion Coating Fuel Tank Coating (2 coats) A029 **3**

Sulphuric Anodize Fuel Tank Coating (2coats) A030 **3**

Chromic Anodize Fuel Tank Coating A031 **3**

Conversion Coating FR Primer+ Polyurethane Topcoat A032 **3**

Chromic Anodize FR Primer A033 **3**

Or simple statement like “the protection rating for all SSIs should be assigned as 3. If a rating of 2 or less seems to be unavoidable during the analysis the analyst must consult with the designers/corrosion-specialists for explanation and/or improvement of design.”

As we can see from the examples above the protection rating is considered “excellent” for most of the structure and doesn’t make any difference on any added protections, for example for the most common:

CAA+PRIMER

CAA+PRIMER+TOP COAT

CAA+PRIMER+TOP COAT + CIC

are at the same rating. No credit taken from Top coat or CIC added protection in the rating system.

The technology today will lead for 95% of the SSI to a “**special attention**” rating. In practice it means this protection rating has no impact on the analysis, as we will always have either an “excellent” protection or “no” protection in case of Accidental Damage. Therefore the requirement of MSG-3 as written today "Emphasis is placed on rating each SSI in relation to other SSIs in the same inspection area, leading to increased inspection emphasis for the most critical SSIs." is not met, as all SSI are rated the same and not "in relation to other SSI"

CIP impact example:

If we consider the SSI representing the upper part of the Cabin fuselage (internal crown area):

Assumptions: no AD expected and ED (Average).

- Traditional design (Development 20 years ago): traditional Aluminium alloy + CAA+ Primer => 12 years interval

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- New design: Al/Li Alloy + CAA + Primer +Top Coat => 12 years interval

As the rating tables haven't been updated over the years, no benefit was taken of the use of new technologies and new protections as part of the rating system. The interval selected is then more restrictive as it should be and doesn't represent the real design which has to be reviewed by the SWG.

Use of an updated table would allow an Higher interval for those items with improved design (protection...)

Recommendation (including Implementation):

MRB expectation is that rating is evolving overtime in accordance with new technologies, therefore an update of the MSG3 is necessary to impose this position:

Our proposal is based on a wording from the MSG3 original issue (and removed at rev 1) and is to update of § 2-4-5- after the second paragraph:

” The scheduled structural maintenance tasks and intervals are developed on the basis of requirements to assure timely detection of Accidental Damage, Environmental Deterioration, and Fatigue Damage. Rating systems for AD and ED should be compatible to allow comparative assessments for each group of SSIs. Emphasis is placed on rating each SSI in relation to other SSIs in the same inspection area, leading to increased inspection emphasis for the most critical SSIs. Manufacturer and operator experience is a key ingredient for these evaluations.”

Ratings are established to rank the importance of a particular condition or influence as it affects each SSI. As a general guideline, a sufficient number of rating values should be assigned to provide the relative gradations desired. Each rating system should be established is customized to the aircraft design or family of aircraft analysed to adequately cover all different SSI.

IMRBPB Position:

Date: 01/MAY/2014

Position: Accepted

Status of Issue Paper (when closed state the closure date): Closed as IP 139 the 01/MAY /2014

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Recommendation for implementation:

Retroactive: Y/ N

Important Note: The IMRBPB positions are not policy. Positions become policy only when the policy is issued formally by the appropriate National Aviation Authority.