

JAA/FAA/TCCA
International MRB Policy Board
Issue Paper

Date: 15.April.2005
IMRBPB # 88

Title:	Consideration of Wear Damage in Structure Analysis.
Submitter:	Airbus, Maintenance Engineering, Customer Services
Issue:	MSG-3 document does not contemplate 'wear' as a type of damage to be considered in the analysis of SSIs.
Problem:	During MSG-3 structure analysis discussions within various Working Groups, several members highlighted the fact that, whereas Accidental Damage (AD), Environmental Deterioration (ED) and Fatigue Damage (FD) is duly considered in the Structure Significant Item analysis, experience shows that another type of damage, Wear Damage, can also have an influence on these items. It is difficult to address wear damage concerns on purely structural items by strictly following the MSG-3 analysis methodology for the current types of damage (i.e. AD, ED, FD). Typical examples of when "wear" could be a concern are those structural installations incorporating rods/struts equipped with bearings/bushings, that are subject to high stress levels and vibration. Experience from similar systems installations indicates that an on-aircraft assessment of wear may require specialist gauges and procedures; therefore, the current structural inspection methods (GVI, DET or SDI) may be inadequate to detect this type of damage. Further discussions within Working Group activities concluded that the wear issue was adequately addressed for those items that were also related to a system (e.g. ATA 27), since they were considered as a failure cause/mode for an existing MSI. In this last case the Systems Working Group was able to duly consider wear damage in the analysis, as the analysis is not based on 'damage sources' but 'failure causes'. Some alternatives were discussed; one of them was to analyse those specific items which were of concern to the Structure WG following the systems MSG-3 logic and the other one was to create a specific 'wear damage' analysis methodology for every SSI. The first approach would lead to the creation of specific MSIs dealing with purely structural items; the second one to the development of a new structural analysis methodology within the MSG-3 structure analysis. This may require a specific wear rating system.

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Recommendation:

ONE (short term):

MSG-3 document to be reviewed to, at least, recognize wear as a type of damage that should be considered in the structure analysis, to ensure that it is not overlooked.

Proposed modification to current MSG-3 Document:

“2-4-2. Scheduled Structural Maintenance

The primary objective of the scheduled structural maintenance is to maintain the inherent airworthiness throughout the operational life of the aircraft in an economical manner. To achieve this, the inspections must meet the detection requirements from each of the AD, ED and FD assessments. Where applicable, other sources of damage/deterioration, such as wear, are to be also considered when establishing scheduled maintenance requirements. Full account may be taken of all applicable inspections occurring in the fleet.”

TWO (mid term):

Discuss the wear damage issue with Industry and IMRBPB with the aim to establish guidelines on the basic method to follow when the user defines detailed methodologies and way of working in his customized PPH, e.g.:

- criteria to identify structural assemblies susceptible to wear,
- identification of potential scheduled tasks to identify / minimise wear, preferably on-aircraft,
- identification of dominant usage parameter for interval,

If needed, a further review to MSG-3 document could be considered.

IMRBPB Position:

October 20th, 2005

Agreement from industry to revise the recommendation of the IP. IMRBPB waiting for revised version before providing position.

Status: Open

20/Feb/2007

MPiG proposed MSG3 revision accepted by PB (refer to IP attachment 1) this in lieu of a revised IP.

Status: Closed

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