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

Initial Date: 20/June/2018
IP Number: CIP IND-2018-04
Revision / Date: 02 19/November/2018

Title: SSI boundary determination guideline

Submitter: Bell

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

Issue:

A consistent approach for SSI boundary determination should be identified.

Currently, MSG-3 document structures section does not provide clear guidance for selection of the boundary of an SSI. It is limited to the definition of the SSI and differentiated it by Other Structural Items (OSIs) and PSEs.

This could lead to the unnecessary increase of tasks numbers, lower intervals, and access issues. In addition, there is inconsistency in the selection of the SSIs boundaries between TCHs.

To define SSI boundaries and having efficient tasks, the following criteria should be considered when breaking down the aircraft structures into SSIs:

a) PSEs; all PSEs must be covered in SSIs
b) By zone; when applicable, the SSI boundary should be harmonized with the zone boundary. This will help the possible transfer of applicable tasks from structures to zonal in the future.
c) By access; a component may be covered by more than one SSI due to different access (e.g. internal/external). SSI boundary should to be defined in a way that the component is accessible from the same access point. In addition, the analyst should consider system installations, wiring and access panels within a zone, to split the area into more than one SSI, if required.
d) ATA or S1000D Standard Numbering Systems (SNS); when selecting an SSI, pay attention to the ATA chapter it will fall within and split the area to more than one SSI, if required.
e) Identical structures for left and right sides; one SSI should be selected to cover both the left and right sides of the symmetrical structure. Minor differences between the LH and RH could still be covered within one SSI, so long as it does not impact the analysis ratings. If required, separate LH and RH tasks can still be selected to reduce MH requirements per task.
f) Material characteristic, and surface protection system; since the structures ED analysis is a conservative approach by selecting the worst-case scenario, the SSI boundary should be defined in a way that will not penalize the whole area of inspection with a low interval due to one component's material or surface protection system. When beneficial, the part with the lowest material characteristic and/or surface protection ratings may be covered by a separate analysis within the SSI to cover the worst case.
g) Effects of accidental damage sources and environmental conditions; when applicable, the SSI boundary should be defined in a way that will cover all the components with the same vulnerability to accidental damage sources and environmental conditions. When required,

a new MSG-3 analysis and task dedicated may be select to cover the worst-case, preventing penalize the whole area with a lower interval.

h) Potential impact of AD on residual strength may be used to define a SSI or MSG-3 analysis and task to cover this scenario.
i) Susceptibility to fatigue; For non-PSE SSIs, the boundary may be determined in accordance with the potential fatigue influence.
j) Assemblies; When there is an assembly with multiple structure items which have the same material, surface protection ratings, same AD/ED exposure, same access, same ATA chapter, and same zone, it is highly recommended that all the assembly components be covered within a single SSI and not multiple SSIs for each component.
k) Detectability: Establish the SSI boundaries based on the ability to detect accidental damages or environmental deteriorations to have efficient inspection task level (i.e.; GVI, DET, SDI)
l) Density of the area: Establish the SSI boundaries based on the density and restrictions of the area for inspection.

Problem:

Some examples of possible problems:

- Example 1: SSI selected based on manufacturing process drawings.
- Example 2: SSI selected for LH/RH identical components and increase task numbers.
- Example 3: SSI selected based on worst material and finish protection rating and penalize the whole area with unnecessary low interval.
- Example 4: SSI boundary selected regardless of different accidental damage sources or environmental conditions and may penalize the whole area with unnecessary low interval.
- Example 5: Separate SSI selected for each component within the same assembly with same ratings, access, and zone, creating extra SSIs and tasks.

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Recommendation (including Implementation):

Add the following paragraph at the end of sub part "a", Section 2-4-1:

a. A **Structural Significant Item (SSI)** is any detail, element or assembly, which contributes significantly to carrying flight, ground, pressure or control loads, and whose failure could affect the structural integrity necessary for the safety of the aircraft.

SSIs must not be confused with Principal Structural Elements, PSE (Section 571 of the applicable certification standard); however, all PSEs must be addressed by the SSIs.

The SSI should be selected at the highest manageable level.
To define SSI boundaries in a way to allow efficient tasking, the following criteria should be considered when breaking down the aircraft structures into SSIs:

- PSE
- Zone
- Access
- Standard Numbering System (SNS)
- Material properties and surface protection system
- Damage sources
- Environment
- Potential impact of accidental damage(s) on residual strength
- Susceptibility to fatigue
- Detectability
- Density of the area

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IMRBPB Position:
Date: **Position:** **Date:** **Position:**

Status of Issue Paper and date:
Active
Incorporated in MSG-3 / IMPS (with details)
Archived

Recommendation for implementation:

Retroactive: Y/ N

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