

# SSI definition update in MSG-3 Vol 1 & 2

## *ROADMAP*

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# BACKGROUND

SSI definition in MSG-3 has been discussed in the past years to cover different aspects:

- consideration of structural items that, if detached in flight, could compromise continued safe flight and landing - **IP 192** [In-flight loss of Structural items]
- consideration of external load, i.e. people supported by external load carrying systems (i.e. hoist/cargo hook etc) - **IP 147** [Clarification of “human occupant” in Volume 2]
- alignment of SSI definitions between MSG-3 Vol 1 and Vol 2 - **EASA CIP 2023-07** [SSI Definition Update in MSG-3]

# CURRENT STATUS

IP 147 Clarification of “human occupant” in Volume 2

Current SSI definition in MSG-3 Vol 2 as follows:

Any detail, element or assembly, which contributes significantly to carrying flight, ground, pressure or control loads **or external load**, and whose failure could affect the structural integrity necessary for the safety of the aircraft **and/or might cause serious or fatal injury to human occupants**.

**NOTE: the term “human occupants” includes people supported by external load carrying systems (i.e. hoist/cargo hook etc).**

Note: highlighted in yellow the implemented changes

# CURRENT STATUS

IP 192 In-flight loss of Structural items

The following statement has been added in MSG-3 Vol 1 & Vol 2 [2-4-1. Aircraft Structure Defined]:

Consideration should be given to any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs.

# CURRENT STATUS

- EASA CIP 2023-07 SSI Definition Update in MSG-3
- The proposal was the inclusion of “serious or fatal injury to human occupants” in the SSI definition of MSG-3 Vol 1 with alignment with the SSI definition of MSG-3 Vol 2, as follows:
- 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 **and/or might cause serious or fatal injury to human occupants.**
- MPIG SWG position:
- MPIG SWG is against the expansion of the scope of the SSI definition in MSG-3 Vol 1
- MPIG SWG discussed internally and believed there was room for alignment of SSI definition in MSG-3 Vol 1 and 2. It has been agreed to open the discussion at the level of the MPIG SWG
- MPIG SWG supported EASA on a roadmap for alignment of SSI definition in MSG-3 Vol 1 and 2

# WAY FORWARD

As result of some MPIG STR Working Group virtual meetings with the participation of EASA, the following points have been considered relevant for a way forward and the definition of a roadmap:

A - Unique SSI definition for MSG-3 Vol 1 & 2 - this can be helpful for MSG-4 (unique volume for rotorcraft & fixed wing is under discussion).

B - Analysis of “hoist/cargo hook” as system components which function is of structural nature (to carry system loads to the aircraft structure).

C - Definition of Human Occupants to be added in MSG-3 Vol 1 & 2 glossary including consideration of people supported by external load carrying system (i.e. “hoist/cargo hook”) – this will allow to cover any person occupying/boarding/disembarking the aircraft during operation, including those supported externally by an aircraft system or structure (e.g. hoist/cargo hook)

# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (PROPOSAL)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

A PROPOSAL has been agreed to be the most appropriate based on the discussions during the MPIG STR Working Group virtual meetings:

## **PROPOSAL:**

Unique SSI definition in MSG-3 Vol 1 & Vol 2 as currently defined in MSG-3 Vol 1:

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.

Definition of “Human Occupant” to be added to the MSG-3 Vol 1 & 2 glossary:

Human occupant: any person occupying/boarding/disembarking the aircraft during operation, including those supported externally by an aircraft system or structure (e.g. personnel-carrying device system), if applicable

# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (PROPOSAL)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

## PROPOSAL:

Current NOTE in MSG-3 Vol 1 & Vol 2 [2-3-1. MSI Selection – Step 1] should be changed as follows:

### NOTE:

1. Structural items, whether designated as SSI or Other Structure, having system related functionality (e.g. firewalls, shields, integral fuel tank boundaries, flight control hinge bearings, drains, door hinges, **hoist system**) need to be addressed in the MSI selection through coordination between Systems and Structures Working Groups in accordance with established transfer policies and procedures.
2. System components that contribute significantly to carrying flight, ground, pressure or control loads and whose failure could affect the structural integrity necessary for the safety of the aircraft should be analyzed in consultation with the Structures Working Group in accordance with established transfer policies and procedures.
3. All safety/emergency systems or equipment should also be included.

# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (PROPOSAL)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

## **PROPOSAL:**

Current statement in MSG-3 Vol 1 & Vol 2 [2-4-1. Aircraft Structure Defined] should be changed as follows:

## **IS:**

Consideration should be given to any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs.

## **PROPOSED:**

Consideration should be given to:

- any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs;
- systems or system components which functions include load carrying (i.e. landing gear, overhead bin, hoist/cargo hook) through coordination between Systems and Structures Working Groups in accordance with established transfer policies and procedures.

# OPEN ITEMS

The following points still remain under discussion and require further discussions:

A - The most appropriate terminology to be used for **carrying devices**:

- **personnel-carrying device system**
- **hoist system**
- **hoist/cargo hook**

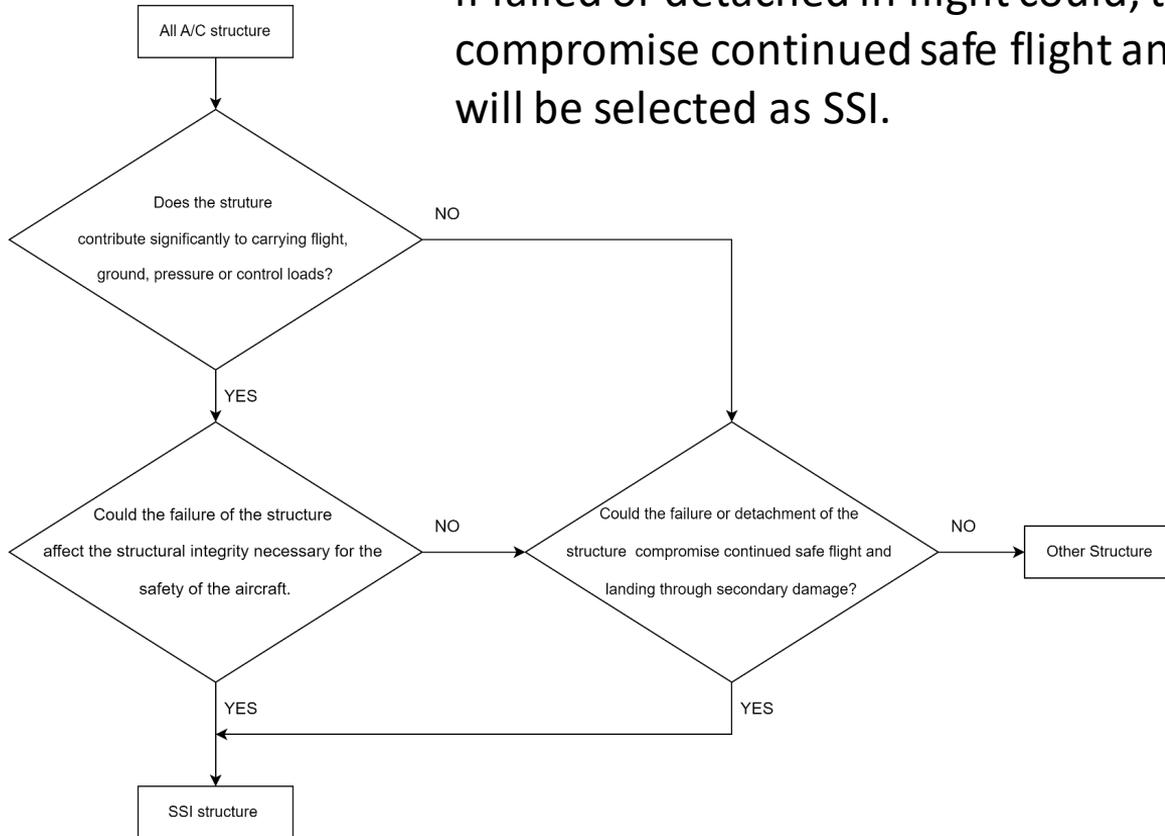
B - The need to better clarify the following statement of MSG-3 Vol 1 & Vol 2 [2-4-1. Aircraft Structure Defined] with a proposed flow chart:

Consideration should be given to:

- any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs

# OPEN ITEMS

The proposed flow chart should clarify that any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing, will be selected as SSI.



# Thank you

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# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (Option 1)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

Two (2) OPTIONS have been proposed by EASA for discussion during the MPIG STR Working Group virtual meetings:

## OPTION 1:

Unique SSI definition in MSG-3 Vol 1 & Vol 2 as follows:

A Structural Significant Item (SSI) is any detail, element or assembly, which contributes significantly to carrying flight, ground, pressure or control loads or external load, and whose failure could affect the structural integrity necessary for the safety of the aircraft or if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing and/or might cause serious or fatal injury to people supported externally by an aircraft system or structure (e.g. hoist system).

Definition of “Human Occupant” added to the MSG-3 Vol 1 & 2 glossary:

Human occupant: any person occupying/boarding/disembarking the aircraft during operation, including those supported externally by an aircraft system or structure (e.g. hoist/cargo hook), if applicable

# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (Option 2)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

## OPTION 2:

Current NOTE in MSG-3 Vol 1 & Vol 2 [2-3-1. MSI Selection – Step 1] should be changed as follows:

### NOTE:

1. Structural items, whether designated as SSI or Other Structure, having system related functionality (e.g. firewalls, shields, integral fuel tank boundaries, flight control hinge bearings, drains, door hinges) need to be addressed in the MSI selection through coordination between Systems and Structures Working Groups in accordance with established transfer policies and procedures.
2. System components that contribute significantly to carrying flight, ground, pressure or control loads and whose failure could affect the structural integrity necessary for the safety of the aircraft should be analyzed in consultation with the Structures Working Group in accordance with established transfer policies and procedures.
3. Consideration could be given to system components which function is of structural nature (i.e. “hoist/cargo hook”) through coordination between Systems and Structures Working Groups in accordance with established transfer policies and procedures.
3. 4. All safety/emergency systems or equipment should also be included.

# Unique SSI definition for MSG-3 Vol 1 & 2 + Additional complementary changes (Option 2)

It addresses the contents of IP 147, IP 192 & EASA CIP 2023-07

## **OPTION 2:**

Current statement in MSG-3 Vol 1 & Vol 2 [2-4-1. Aircraft Structure Defined] should be changed as follows:

### **IS:**

Consideration should be given to any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs.

### **PROPOSED:**

Consideration should be given to:

- any structure that, if failed or detached in flight could, through secondary damage, compromise continued safe flight and landing. The selection of such structure items as SSI should be based on inputs from the design office through simulations, safety hazard analysis, fatigue test results, and in-service experience with similar designs;
- system components which function is of structural nature (i.e. "hoist/cargo hook") through coordination between Systems and Structures Working Groups in accordance with established transfer policies and procedures.