TERMS OF REFERENCE

Task Nr:	25.028
Issue:	1
Date:	9 February 2009
Regulatory reference:	CS 25.729(f); CS 25.963(e); CS 25.903(d); CS 25.1309
Reference documents:	Pre RIA 25.028-2 dated 04 July 2006; JAA TGM/25/08 issue 2; FAR Part 25; AC 25.963-1

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1. Subject: Protection from debris impacts

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2. Problem / Statement of issue and justification; reason for regulatory evolution (regulatory tasks):

Aeroplanes are subject to damage by various objects or debris impacts while in service.

Among this variety of debris and objects encountered, debris originating from tyre/wheel failure, engine failure (low energy and small fragments) and runway debris (including foreign objects) are of particular concern, and will form the focus of this rulemaking task.

Previously, the JAA Safety Strategy Initiative (JSSI) had identified the issue of protection from tyre/wheel debris impact as a significant safety issue. This was subsequently confirmed by the Air France Concorde accident in July 2000.

A review of the ICAO ADREP database shows that, as of 24 Sept 2008, the following events have been reported (for aeroplanes with a maximum mass over 5700 kg):

- Tyre/wheel failure debris related events: 14 accidents and 26 serious incidents;
- Engine debris related events: 9 accidents and 11 serious incidents;
- Other ground debris and objects related events: 8 accidents and 33 serious incidents.

These kinds of threats are already addressed in CS-25 (mainly through CS-25.729(f); CS-25.903(d); CS-25.963(e); CS-25.1309). However, service experience has shown that these provisions need to be improved and a standardised certification approach developed to ensure that the relevant CS-25 paragraphs are addressed consistently.

Note: summary of above mentioned main CS-25 paragraphs:

- CS 25.729(f): addresses protection from tyres burst and debris, but limited to equipment on landing gear and wheel well;
- CS 25.903 (d): requires to minimise the hazards to the aeroplane in the event of an engine rotor failure or of a fire originating within the engine which burns through the engine case;
- CS 25.963(e): addresses protection from tyre fragments, low energy engine debris or similar other debris, fire, but only for fuel tank access covers;

- CS 25.1309: considers these kinds of failures as a Particular Risk, but more oriented on System aspects.

3. Objective:

To upgrade CS-25 by modifying existing paragraphs and AMCs, and/or introducing new paragraph(s) and AMC(s). This new regulatory material will cover the protection of the whole aeroplane against tyre/wheel failure debris, engine debris (low energy debris and small fragments), other likely debris (runway debris including foreign objects) and subsequent threats.

As today various models are used for different paragraphs, the goal of this task is to rationalise the current regulatory material by developing a model for each type of threat which will be applicable to the whole aeroplane.

4. Specific tasks and interface issues (Deliverables):

1) Identify through statistical analysis of in-service occurrences likely threats from tyre/wheel failure debris (size of tyre debris, weight of tyre debris, …), engine debris (low energy debris and small fragment) and other likely debris (runway debris including foreign objects);

2) Review existing threat models (present in AMC 20-128A, AMC 25.963(e), JAA TGM/25/08 issue 2, CRIs) and their applicability;

3) Develop common threat models applicable to the whole aeroplane, and to both Systems and Structure;

4) To upgrade CS-25 by modifying existing paragraphs and AMCs, and/or introducing new paragraph(s) and AMC(s) (to be determined by the working group), in harmonisation with FAA and TCCA.

5. Working Methods (in addition to the applicable Agency procedures):

Group. The following specialists need to be represented: Hydro-mechanical systems (in particular Landing gear), Structures, Powerplant.

Note: Sub-groups could be created later on if deemed necessary due to the complexity of the task.

6. Time scale, milestones:

NPA publication: 2010

CS-25 publication: 2011