TERMS OF REFERENCE

Task Nr:	RMT.0223 (MDM.024 & MDM.025)
Issue:	1
Date:	10 February 2012
Regulatory reference:	CS-23, CS-25, CS-27, CS-29, AMC-20
Reference documents:	— FAR 23.1308, 25.1317, 27.1317, 29.1317 High-intensity Radiated Fields (HIRF) Protection, dated August 6, 2007. — FAR 23.1306, 25.1316, 27.1316, 29.1316 Electrical and Electronic System Lightning Protection, dated August 8, 2011. — ARAC EEHWG Proposed NPA/NPRM + AC/AMJ 20.1317, dated November 1998. — Advisory Circular (AC) 20-136B, 'Aircraft Electrical and Electronic System Lightning Protection', dated September 2011. — Advisory Circular (AC) 20-158, 'The Certification of Aircraft Electrical and Electronics Systems for Operation with High-Intensity Radiated Fields (HIRF) Environment'. — EUROCAE Documents ED-81, ED-84, ED-91, ED-107A.

1. Subject: High Intensity Radiated Field (HIRF) & Lightning

Note:

Due to the similarity between the HIRF (MDM.024) and Lightning (MDM.025) tasks, it has been proposed to merge these 2 tasks to maximise efficiency of the rulemaking process.

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

Aircraft electrical and electronic equipment can be susceptible to adverse effects due to electromagnetic radiation and lightning. The essential requirements for airworthiness as outlined in the Basic Regulation (EC 216/2008 Annex 1 (2.c.1)) stipulates that 'no unsafe condition must occur from exposure to phenomena such as […] lightning, […] high intensity radiated fields […], reasonably expected to occur during product operation.'

With the increased use of critical and essential electrical/electronic systems on aircraft, coupled with the development and use of non-metallic structural materials that are more 'transparent' to electromagnetic radiation and have low electrical conductivity, it has been recognised that HIRF & lightning standards would need to be enhanced to counter the growing threat.

ARAC was tasked in 1992 to recommend new or changed requirements addressing HIRF (Task 1) and Lightning protection (Task 2). The ARAC Electromagnetic Effects Harmonized Working Group (EEHWG) finalised in November 1998 a package of common JAA NPA/FAA NPRM and associated Advisory Circular/Advisory Material Joint for the Certification of Aircraft Electrical and Electronic Systems in HIRF Environment and for system lightning protection. In

order to replace HIRF requirements introduced by dedicated Issue Papers, the FAA adopted in August 2007 some requirements (FAR 23.1308 (Amdt 23-57), 25.1317 (Amdt 25-122), 27.1317 (Admt 27-42), 29.1319 (Amdt 29-49) and AC 20-158) based on the EEHWG developed NPRM and associated AC 20.1317. Recently, the FAA has further published new and revised rules for lightning protection (FAR 23.1306 (Amdt 23-61), 25.1316 (Amdt 25-134), 27.1316 (Amdt 27-46) and 29.1316 (Amdt 29-53), effective August 2011, which references AC 20-136).

Due to the need to prioritise rulemaking tasks, the Agency has not yet amended the CSs to introduce the HIRF & Lightning requirements (with the exception of 25.1316, which was introduced in JAR-25 Change 15), but instead relies upon Certification Review Items to introduce a Special Condition and Interpretative Material based on JAA INT POLs 23/1, 23/3, 25/2, 25/4, 27&29/1 (referring to the draft JAA NPAs, AMJ 20.1317 and EUROCAE Documents ED-81, ED-84, ED-91).

As a result of the Agency's delay in adopting the recommended HIRF standards, some drift between the Agency and FAA has occurred; the methodology adopted by both authorities is similar but there are still some slight differences in the wording of the HIRF requirements and the definition of the equipment HIRF test levels (due to references to different Revision of Environmental standards).

Moreover, the management of CRIs to introduce HIRF & Lightning requirements and Interpretative Materials is a burden and their introduction within the CSs will simplify certification activities.

3. Objective:

To update CSs to incorporate changes in HIRF & Lightning standards based on the recommendations from the EEHWG but duly amended to reflect recent developments. This will enable the Agency to fulfil its obligation under Article 19 of the Basic Regulation to maintain the CSs to reflect the state of the art and best practice.

To establish consistent standards for HIRF & lightning protection for electrical and electronic systems across different aircraft categories.

To provide greater harmonisation between the FAA and EASA in matters of HIRF & lightning protection.

4. Specific tasks and interface issues (Deliverables):

In order to reach the objectives above:

— review the JAA NPAs and the FAR HIRF & Lightning requirements (and associated Appendices);

— propose changes to CS-23, CS-25, CS-27 and CS-29 based on this review and by keeping as much as possible the wording of the EEHWG recommendations and FAA text;

— propose a new AMC-20 based on the draft AC/AMJ 20.1317 and FAA AC 20-158, with some updates to take into account the latest industry standards for HIRF protection;

— propose a new AMC-20 based on the FAA AC 20-53B, AC 20-136B and EUROCAE Documents;

— coordinate with FAA to ensure the highest level of harmonisation.

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

Agency task.

6. Time scale, milestones:

Please refer to the EASA - Rulemaking programme on the Agency's website.