GERMANY

National mechanism:

Product Assurance and Safety Requirements for DLR Space Projects: April 2012 (Issue 7.0)

Legal framework:

- *Raumfahrtaufgabenübertragungsgesetz* 22 August 1998, BGBl. I, 2510 (Delegation of Space Activities Act)
- *Telekommunikationsgesetz*, 22 June 2004, BGBl. I, 1190 (Telecommunications Act), as amended 7 August 2013, BGBl. I, 3154

Description:

The Space Administration of the German Aerospace Centre (DLR) implements the German national space program. It is the policy of DLR that each contractor involved in the implementation of a particular space mission applies product assurance and safety requirements, including space debris mitigation, throughout all project phases.

For space projects of the Space Administration of DLR, space debris mitigation requirements are mandatory as part of the *Product Assurance and Safety Requirements for DLR Space Projects (DLR Requirements)*. This catalogue provides the core from which project-specific product assurance and safety requirements are prepared and tailored. The document includes space debris mitigation measures and specifies these requirements.

In implementing a particular space mission, the requirements contained in the *DLR Requirements* are tailored to the respective project according to the mission characteristics. The aim is to ensure the application of the relevant requirements, their verifiability and their practicability during the development, production and operation phases of a space project. The tailored requirements form part of the project requirements in the invitation of tenders as well as of the contractual agreements with the respective contractors. In the course of the implementation of the space mission, non-compliance with any of the tailored requirements may be possible on the basis of a waiver. The waiver shall provide the rationale and justification for the deviation and requires formal approval by DLR.

The *DLR Requirements* comprise various requirements that aim to implement a comprehensive system of space debris mitigation. Their general objective is to limit the creation of new space debris and thus to limit the risk to other current and future space missions and the risk to human life. The measures to be adopted in order to achieve this objective include the following categories of requirements:

5.7.7 Space Debris Mitigation Assessments

5.7.10 Space Debris Mitigation Assessment Reports

in respect to: the release mission-related objects, accidental breakups and potential explosions, potential for on-orbit collisions, post-mission disposal plans and procedures and re-entry hazards

5.7. 11 Design Measures

in respect to: prevention of mission-related objects, solid propellants and pyrotechnics, materials and technologies, fragmentation prevention, malfunctioning prevention, on-orbit collisions prevention, limitation of consequences from impact of existing debris/meteorites

5.7.12 Passivation

5.7.13 Disposal Maneuvers

in respect to: LEO and GEO protected regions as well as MEO

5.7.14 Re-entry Safety Measures

in respect to: type of re-entry, methods of compliance assessment, notification

5.7.15 Project Reviews

Applicability:

The *Product Assurance and Safety Requirements for DLR Space Projects* are mandatory throughout all phases of all space missions of the DLR Space Administration.

Relation to international mechanisms:

The space debris mitigation requirements of the *Product Assurance and Safety Requirements for DLR Space Projects* are consistent with the Space Debris Mitigation Guidelines of the Committee, the IADC Space Debris Mitigation Guidelines and the European Code of Conduct for Space Debris Mitigation. They furthermore refer to relevant ISO standards, including ISO 24113, and standards adopted by the European Cooperation for Space Standardization ECSS. The recommendations of the ITU Radiocommunication Assembly in respect to space debris mitigation (ITU-R S.1003-2, Environmental protection of the geostationary-satellite orbit) are among the conditions which the users of German orbit and frequency rights have to fulfill (on the basis of § 56 *Telekommunikationsgesetz*).

Germany has contributed to the development of the IADC Space Debris Mitigation Guidelines in the scope of the IADC and participated in the elaboration of the European Code of Conduct for Space Debris Mitigation in the European Network of Competencies. Germany regards the Space Debris Mitigation Guidelines of the Committee as providing

generally accepted guidance for the adoption of national mechanisms governing space debris mitigation.[1]

Link to other national mechanisms:

The mechanisms NASA STD 8719.14 "Process for Limiting Orbital Debris" and NASA-NPR-8715.6A "Procedural Requirements for Limiting Orbital Debris" represent informative references for the *DLR Requirements*.

References:

- http://www.gesetze-im-internet.de/ra_g/BJNR010140990.html
- http://www.gesetze-im-internet.de/tkg_2004/BJNR119000004.html

[1] German Statement under Agenda Item 11 of the 49th session of the Legal Subcommittee (22 March-1 April 2010).