



EUROPEAN COMMISSION
 ENTERPRISE AND INDUSTRY DIRECTORATE-GENERAL
 Space, security and GMES
Space Policy and Coordination

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M/496 EN

**MANDATE ADDRESSED TO CEN, CENELEC AND ETSI TO DEVELOP
 STANDARDISATION REGARDING SPACE INDUSTRY
 (PHASE 3 OF THE PROCESS)**

1. SCOPE

This mandate establishes a programme for space related standards to:

- ensure an adequate assurance and resilience of space hardware and services in Europe;
- foster the European projects (national, ESA and European Union ones), particularly the Galileo satellite navigation system, the Global Monitoring for Environment and Security (GMES) and the projects in the satellite telecommunications and Earth Observation fields;
- stimulate the emergence of European new markets, services and end-user terminals;
- increase the synergy between civil and military applications and programmes;
- mitigate space related threats in the framework of European Space Situational Awareness activities;
- support the international competitiveness of the European space industry;
- expand international cooperation.

The mandate is drawn up under the European Space Policy scope. One of the principal challenges of the European Space Policy will be to pave the way to integrate a variety of space systems from the EU, the European Space Agency and individual Member States into a European space infrastructure, which will support the implementation of a wide range of EU policies. The functioning of all systems within this integrative approach and the full utilization of its potential can only be guaranteed by the preparation of the necessary standards.

The entry into force of the Lisbon Treaty on 1st December 2009 provides the EU with an explicit competence in Space. Article 189(1) confirms the need to establish a European Space Policy, it reads as follows: "*To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw*

up a European Space Policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space."

2. JUSTIFICATION

2.1. Rationale and relevant political and legal context

The European Space policy is demand-driven, to exploit the special benefits space technologies can deliver in support of key Union policies and objectives: faster economic growth, job creation and industrial competitiveness, enlargement and cohesion, sustainable development, environment, climate, security and defence for the European citizen.

The Communication from the Commission to the Council and the European Parliament on European Space Policy¹ published on 26 April 2007 points on standardisation as set out hereafter:

- It is stressed the technological support for GALILEO will continue through applications research and a coherent system evolution programme. In order to provide safe and guaranteed applications, the necessary framework in terms of certified services and products, **global standards** and interference monitoring capabilities has to be implemented;
- Under the Security and Defense theme, the EU approach to crisis management emphasizes the synergy between civilians and military actors, and stresses the necessary interoperability between civilian and military actors. To this end, it suggests searching for more cost-effective solution through sharing and pooling the resources of European civilian and military space programmes, drawing on multiple use technology and **common standards**.
- Two key factors to determine the regulatory framework specific to space sector are related to standards. Firstly **Standards give clarity regarding future markets, as a basis for investment**. Where public authorities are the major users of space, they have to drive the development of **standards**. Secondly **full interoperability between national and European space and ground-based systems is urgent**, if Europe is to take maximum advantage of its different space assets. Interoperability and **standardisation** are intertwined issues.
- In the key actions proposed. It is stressed on action (9) that “the Commission envisages to ask the **European standards organizations** to make assessment of necessary future standardisation in support of the regulatory framework; ...”

In line with the Communication, the Resolution of the Space Council on 22 May 2007 on the European Space Policy establishes a political framework for space in Europe. It has been followed by the Resolution “Taking forward the European Space Policy” of 26 September 2008 that sets out new priority areas for the further implementation and development of the European Space Policy”: space and climate change, contribution of space to the Lisbon strategy, space and security and space exploration.

¹ COM(2007)212 final, 26/04/2007, European Space Policy

In this framework the European Space Policy will have to promote a set of European space standards which are capable of implementation on all existing and future space projects, activities including:

- The Galileo satellite navigation system,
- The GMES programme and other satellite applications for the environment, safety & security,
- The activities related to European Space Situational Awareness,
- Other space application fields such as telecommunications and Earth observation,
- Dual use (civil and military purposes) space programmes,
- Launch systems at the Europe's Spaceport in Kourou,
- The "value chain" of commercial space systems,
- Downstream activities to facilitate users needs developments,
- The International Space Station and other international co-operative programmes.

The European Space Policy takes account of international demands and obligations. It calls for the development of standards that are required for issues for European policies and future European/global legislation: space debris, planetary protection, militarization of space, security, crisis management, environment, climate, etc. Where applicable, space standards should be developed as to be compatible and aligned with already existing standards in other relevant domains such as defence, geographic information systems (GIS), programme management, etc.

The anticipated standards shall set criteria for performance, accuracy, interoperability and compatibility, safety and user-friendliness that are essential for modern space-based infrastructures.

This mandate provides the necessary support from the European Commission, the European Defence Agency and the Member States to European standards organizations and stakeholders to ensure the coordinated development, of the necessary standards.

2.2. Relevant legal context

United Nations Treaties and Principles on Space Law:

- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies²;
- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space³;

² The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the "Outer Space Treaty", adopted by the General Assembly in its resolution 2222 (XXI)), opened for signature on 27 January 1967, entered into force on 10 October 1967, 98 ratifications and 27 signatures (as of 1 January 2006); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

- Convention on International Liability for Damage Caused by Space Objects⁴;
- Convention on Registration of Objects Launched into Outer Space, and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies⁵.
- Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space⁶;
- Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting⁷;
- The Principles Relating to Remote Sensing of the Earth from Outer Space⁸;
- The Principles Relevant to the Use of Nuclear Power Sources in Outer Space⁹;
- Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.¹⁰

As well as:

- The Radio Equipment and Telecommunications Terminal Equipment Directive.¹¹
- The European Union draft for an International Code of Conduct for Outer Space Activities (currently being reviewed on the basis of international space faring nations

³ The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the "Rescue Agreement", adopted by the General Assembly in its resolution 2345 (XXII)), opened for signature on 22 April 1968, entered into force on 3 December 1968, 88 ratifications, 25 signatures, and 1 acceptance of rights and obligations (as of 1 January 2006); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁴ The Convention on International Liability for Damage Caused by Space Objects (the "Liability Convention", adopted by the General Assembly in its resolution 2777 (XXVI)), opened for signature on 29 March 1972, entered into force on 1 September 1972, 83 ratifications, 25 signatures, and 3 acceptances of rights and obligations (as of 1 January 2006); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁵ The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the "Moon Agreement", adopted by the General Assembly in its resolution 34/68), opened for signature on 18 December 1979, entered into force on 11 July 1984, 12 ratifications and 4 signatures (as of 1 January 2006); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁶ UN General Assembly resolution 1962 (XVIII) of 13 December 1963); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁷ UN General Assembly resolution 37/92 of 10 December 1982); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁸ UN General Assembly resolution 41/65 of 3 December 1986); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

⁹ UN General Assembly resolution 47/68 of 14 December 1992); <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

¹⁰ UN General Assembly resolution 51/122 of 13 December 1996; <http://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

¹¹ DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity, O J. 7/4 1999 page 10-28

consultations with the objective to propose it for signature to the International Community).

3. BACKGROUND

Relation with the Security standardisation mandate to come from the European Commission

A programming **Mandate** has been issued in June 2007 by the European Commission to CEN , CENELEC and ETSI to develop a feasibility study and a work programme in the field of **space industry standards**;

CEN has accepted to take the lead to carry out the work requested by mandate M/415, with CENELEC and ETSI participation;

The mandate explicitly requested the ESOs (European Standardisation Organisations) to take due account of the work already existing in the framework of the European Cooperation for Space Standardisation (ECSS). ECSS and representative from ESA and several industry stakeholders have actively participated in the working group CEN/BT/WG 202 in charge of implementing the task.

Two sequential tasks have been carried out:

- Phase 1: A **feasibility study** has been conducted to identify the current state of play in space standardisation and to identify the priorities for a wide range of elements and applications and the actors who should participate in each area of work. Phase 1 has been scheduled **from November 2007 to July 2008**.

The final report of phase 1 presents the inventory of existing space systems and associated terrestrial systems in Europe. It also proposes a road map for Phase 2 with sectors where detailed standardisation needs will be indentified.

- Phase 2: This phase has been scheduled **from September 2008 to March 2010** to state the standardisation needs and prepare **a comprehensive standardisation work programme** (in the form of sectorial dossiers) for each identified space sector and application.

The final report of phase 2, issued on February 2010 presents a comprehensive standardisation programme will in the form of 10 sectorial dossiers that sets out this mandate work plan for standardisation.

4. DESCRIPTION OF THE MANDATE

The standardisation programme shall concentrate on the scope defined by the ten sectorial dossiers set out in the phase 2 final report of Mandate M/415, which are spelled out hereafter:

- Navigation and Positioning (NP) Receivers for Road Applications and Airport Services [**Sectorial dossier 1**];
- Integration of Navigation and Positioning (NP) Applications with Telecommunications (TEL) [**Sectorial dossier 2**];

- Information Exchange, including Data Format, in support of applications defined in a "System of Systems" environment (in particular inside and between Earth Observation (EO), Navigation and Positioning (NP), and Telecommunications (TEL)) [**Sectorial dossier 3**];
- Interoperability and Integration of Mobile Satellite Systems (MMS) and Fixed Satellite Systems (FSS) with Terrestrial Systems in particular Next Generation Networks (NGN), and with Global Navigation Satellite Systems (GNSS) in particular Galileo [**Sectorial dossier 4**];
- Planetary protection [**Sectorial dossier 5**];
- Space Situational Awareness (SSA) monitoring [**Sectorial dossier 6**]¹²;
- Dual use ground segment interfaces in Earth Observation (EO) [**Sectorial dossier 7**];
- Interfaces towards Earth Observation (EO) Downstream Services; Persistent Testbed, Conformance Testing and Fast Take Up Measures for EO Standards [**Sectorial dossier 8**];
- Disaster Management [**Sectorial dossier 9**];
- Payload Interfaces for launchers [**Sectorial dossier 10**].

¹² It is suggested to start this activity only after the next ESA ministerial conference, when the development frame for the European SSA will be clarified.

The standardisation programme shall be implemented in a way that allows to:

- 4.1. tackle issues of design and manufacture of equipment, environmental aspects, services, quality, safety and interoperability;
- 4.2. help establish a European position in the development of standards required for future European/global legislation: space debris, planetary protection;
- 4.3. propose how to provide the necessary assistance to industry and relevant agencies through coordinated training and promotion activities;
- 4.4. take into consideration the relevant political context (see also §2.2);
- 4.5. contribute to the standardisation programmes already in progress and their finalisation; space standards to be developed, including in the downstream sector, should rely preferably on industry standards already existing or in progress within the European or international standardisation bodies;
- 4.6. involve scientific/technical knowledge into the development of standards in order to support innovation;
- 4.7. ease/increase synergies between application fields, including civil and military ones;
- 4.8. take into consideration the ECSS standards, published and in production for integration in the EN system and to identify and propose new ECSS work;
- 4.9. A prioritization is established to deliver the different standards linked to the ten sectorial dossiers. The present mandate supports the implementation of the work necessary in the scope of the ten sectorial dossiers, but a special care should be taken to treat as a priority the following sectorial dossiers that should be delivered the faster possible:

- Sectorial dossiers linked with the programmes Galileo and GMES;
- Sectorial dossiers linked to civil - military synergies;
- Analysis of the existing ECSS standards to publish them, if possible, as European standards;
- Dual use ground segment interfaces in Earth Observation (EO) [**Sectorial dossier 7**];
- Standards for Satellite telecommunications [**in Sectorial dossiers 4 and 9**];
- Disaster Management [**Sectorial dossier 9**].

4.10. Transversal issues should be addressed with special care among the sectorial dossiers and to avoid duplication of work between the sectorial dossiers. One example is Sectorial dossier 9 on Disaster Management as it contains common points and critical interdependencies with the Sectorial dossier 4 on Interoperability and Integration of Satellite systems with Terrestrial Systems.

4.11. It is important that work on standards creates the consensus needed for their eventual approval and implementation. A consensus based approach should ensure that standards are operationally useful and more widely implemented.

4.12. The work on standards identified in the Sectorial dossiers should remain under review and should be revised if needed, in order to ensure that their scope remains relevant and/or to reflect any changes in the industry priorities.

5. EXECUTION OF THE MANDATE

5.1. The Commission hereby requests CEN, CENELEC and ETSI in coordination to carry out the work described above.

5.2. CEN, CENELEC and ETSI shall provide, within 24 months of acceptance of the mandate, standards relating to the priority list (see §4.8).

5.3. CEN, CENELEC and ETSI shall provide, within 36 months of acceptance of the mandate, standards relating to the sectorial dossiers set out in the present mandate.

5.4. While executing the mandate, CEN, CENELEC and ETSI shall take into account the work carried out by the ECSS (European Co-operation for Space Standardisation) (ECSS) hosted by ESA (European Space Agency) and establish a process of cooperation to coordinate their activities in order to avoid any duplication. It will be necessary to specify how to integrate ECSS publications and to agree on the mechanism for responsibilities for new work, taking into account the ECSS experience and competency in the field of standardisation of upstream activities (see point 4.7). Coordination between CEN, CENELEC and ETSI, and ECSS should be undertaken each time work on space standardisation activities is proposed in order to prevent duplication, ensure coherency amongst standards and to agree which organisation will lead the resulting standardisation activities. If necessary, coordination issues will be brought to the Space Standardisation Monitoring Group (see point 5.7) in order to generate a solution acceptable to all parties.

The definition of upstream and downstream standards¹³ is set out hereafter:

Upstream standards: standards needed and to be used for the design, development, testing and operation of space and on-ground associated systems and products;

Downstream standards: standards for exchange, processing and utilization of mission data in support of end user applications.

¹³ European Commission leaves to CEN, CENELEC, ETSI and ECSS the possibility to further refine these definitions

5.5. CEN, CENELEC and ETSI shall take into account scientific/technical knowledge of the European Space Agency and national space agencies.

5.6. CEN, CENELEC and ETSI shall take care not to duplicate the work of this mandate with the mandate on Security Standards to be published. It will include standardisation on protection against natural or man-made disasters like the effects produced by earthquakes, volcanoes or pandemics that may interfere with the Sectorial dossier 9 dealing with Disaster Monitoring, Prevention and Relief Management (Interoperability and Transverse Interfacing issues). Also, more generally as stated above, in order to avoid duplication of work and/or production of conflicting standards, efforts should be focused also on contributing to the standardisation programmes already in progress and their finalisation. Furthermore, space standards to be developed, especially in the downstream sector, should rely preferably on industry standards already existing or in progress within the European or international standardisation bodies.

5.7. CEN, CENELEC and ETSI shall propose Terms of Reference to create a Space Standardisation Monitoring Group with the participation of the European Commission, EDA, CEN, CENELEC, ETSI, ECSS and, ESA and Eurospace (ESA and Eurospace are involved directly for matters relating to downstream activities while for upstream matters they are involved via ECSS) to follow and monitor the activities related to the execution of this mandate work programme. This Group should meet at least twice a year.

6. BODIES TO BE ASSOCIATED

The execution of the mandate should be undertaken in cooperation with the widest possible range of interested groups: the European Co-operation for Space Standardisation and the European Space Agency in particular, international standards bodies (ISO, IEC, ITU), European space industry (Eurospace), national space agencies and regulatory authorities of the Member States, the European Global Navigation Satellite System (GNSS) European GNSS Agency, the European Defence Agency (EDA), the European Satellite Operators Association (ESOA), the Integral SatCom Initiative Technology Platform (ISI), the European Meteorological Infrastructure (EMI), representatives from both space equipment manufacturing and space related services industry, from associated industries, ANEC¹⁴, NORMAPME¹⁵, ETUI-REHS¹⁶ and ECOS¹⁷, project stakeholders involved in relevant areas of the Community programmes.

The present mandate may be amended by common agreement should that prove to be necessary during the course of the work.

¹⁴ European Association for the Coordination of Consumer Representation in Standardisation

¹⁵ European Office of Crafts, Trades and Small and Medium- Sized Enterprises for Standardisation

¹⁶ European Trade Union Institute - Research, Education, Health and Safety

¹⁷ European Environmental Citizens Organizations for Standardisation