CEN-CENELEC JTC 5 Space

JTC5 Chair Presentation

From Space to Earth & Back:
How Standards Support Space Applications for Europe

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Why Space Standardisation?

- **Competitiveness**
  enabling our industry to remain competitive and enter into new markets.
- **Efficiency**
  making the development, manufacturing and supply of products/services more efficient, reliable, safer and sustainable.

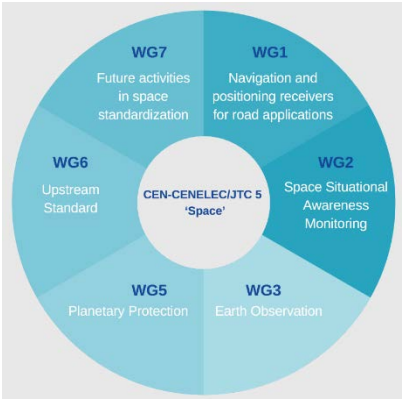
- **Interoperability**
  allowing inter organization satellites manufacturing, operation and in-orbit servicing.
- **Knowledge transfer & Education**
  aiding in transferring knowledge and the education of today's engineers, and those of the future.
- **Ease of Trade**
  allowing easy and fair trade between organizations.

CEN-CENELEC/JTC 5 ‘Space’

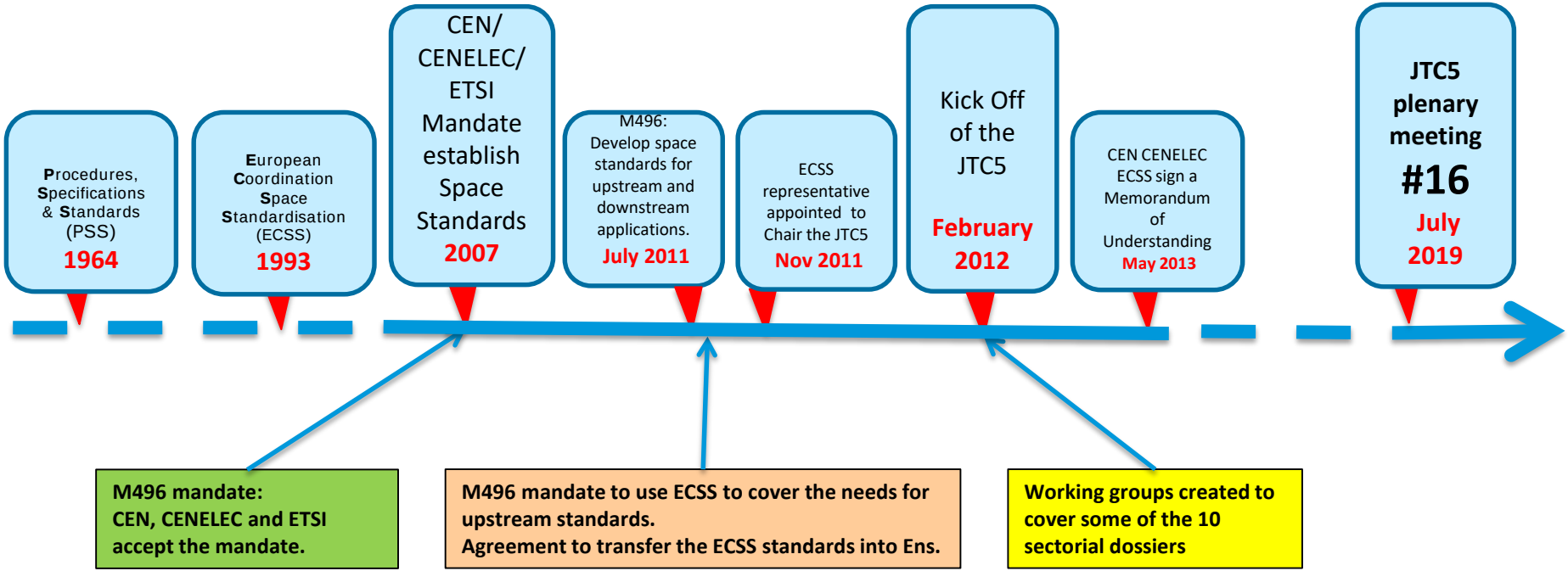
- Covers all standardisation activities in CEN and CENELEC related to “Space”, including dual-use aspects, systems of systems, as well as upstream and downstream applications.
- Develops European Standards to support the implementation of EU-level space projects.
- It is supported by 6 Working Groups who are in charge of drafting standards.
- 76 Committee Members, Document Monitors and Observers.

European Space Standardization

How standards support space applications for Europe

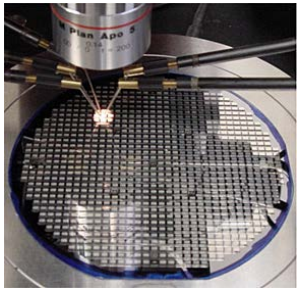


European Space Standardisation: Timeline



Upstream and Downstream Standards

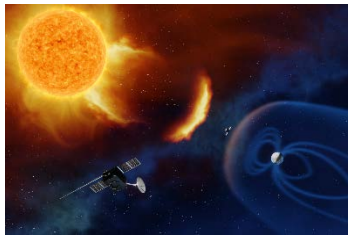
Upstream Standards: design, development, testing, launching and operation of space and on-ground associated systems and products



ECSS

- ECSS started in 1993
- Driven by a partnership of industries and space agencies
- Consensus of industry and agency experts
- State-of-the-art, best engineering practices
- A total of nearly 33000 requirements

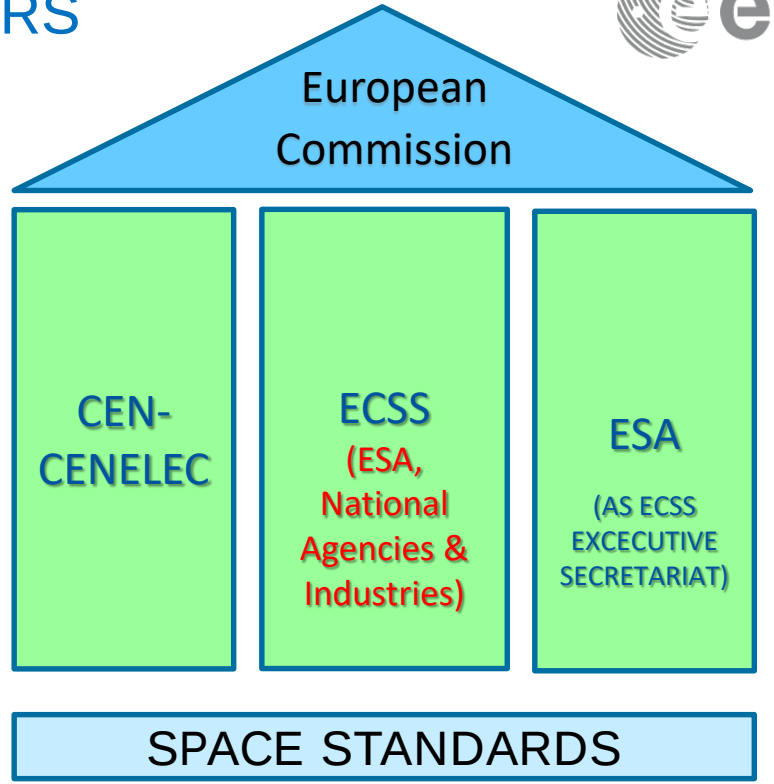
Downstream Standards: exchange, processing and utilization of space mission data in support of end user applications



- Earth Observation (EO): Disaster-management, Meteorology, and Climate-monitoring/change.
- Navigation: GNSS for Automobile, Maritime and Aircraft management.
- Space Situation awareness: Meteoroid, Radiation and Space debris

Upstream Standards: KEY PLAYERS

- European Commission
- CEN-CENELEC
- European Cooperation for Space Standards (ECSS)
- European Space Agency



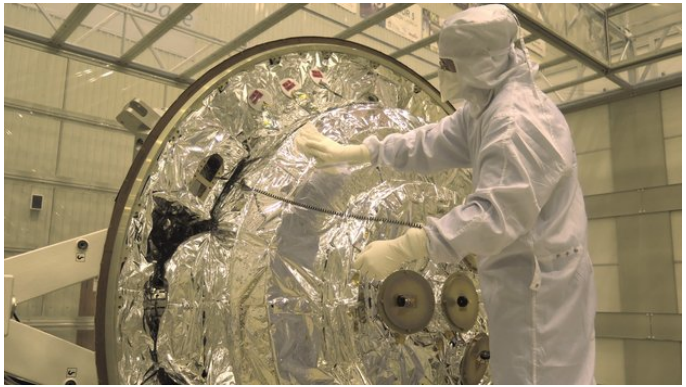
126 EUROPEAN NORMS (EN) PUBLISHED SO FAR FROM ECSS STANDARDS

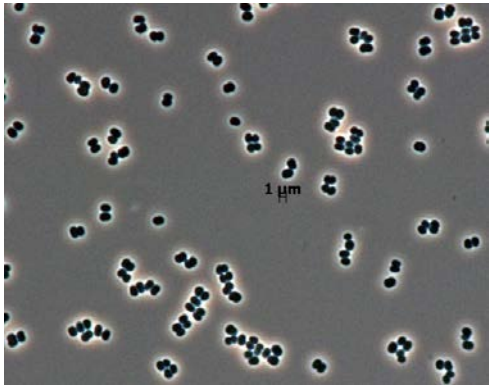
Upstream Standards

WG5: Planetary protection

- **“Protecting** solar system bodies from contamination by Earth life, and **protecting** Earth from possible contamination that may be returned from other solar system bodies”.

- **ECSS Standard**





Downstream Standards

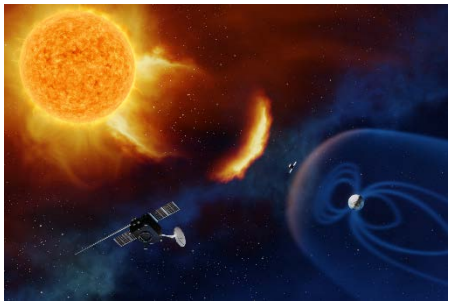
WG1: Navigation and positioning receivers for road applications and airport services

- “To support the deployment of critical transport applications in the domain of Automotive, Maritime and Aircraft“.

IFSTTAR

WG2: Space Situational Awareness (SSA) monitoring

"Protection of Earth population and infrastructures from space environmental threats"



Near Earth Objects:

- To establish and support a European capability for the protection of Earth population, as well as, its critical space and ground infrastructure from threats by potential asteroid impacts.

Space Surveillance and Tracking (SST):

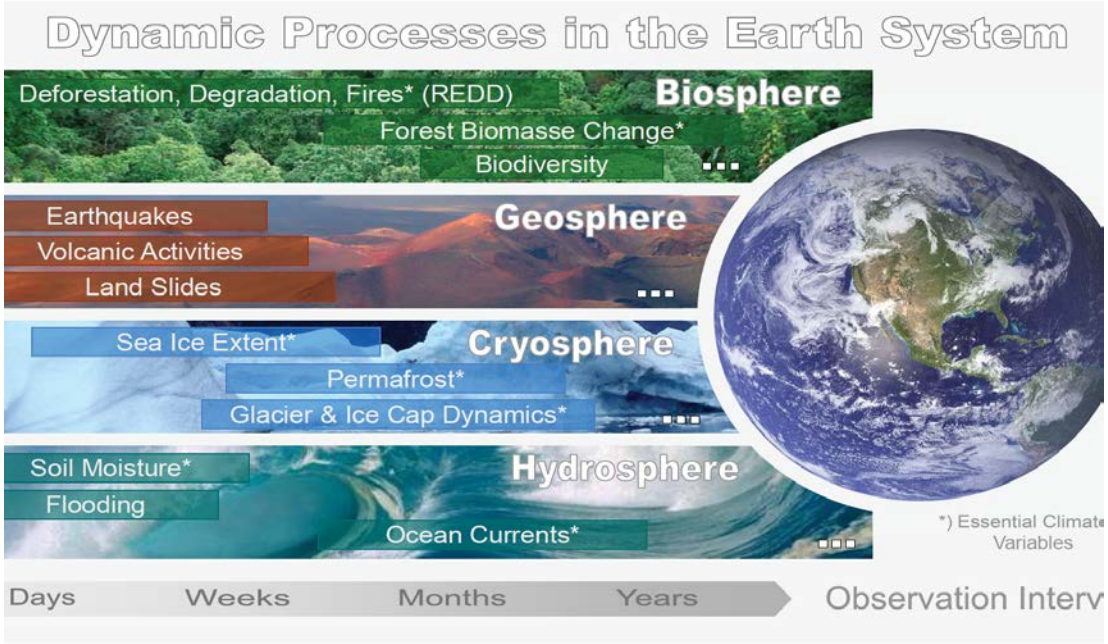
- Create and maintain a catalogue of "man-made" space objects.

Space Weather:

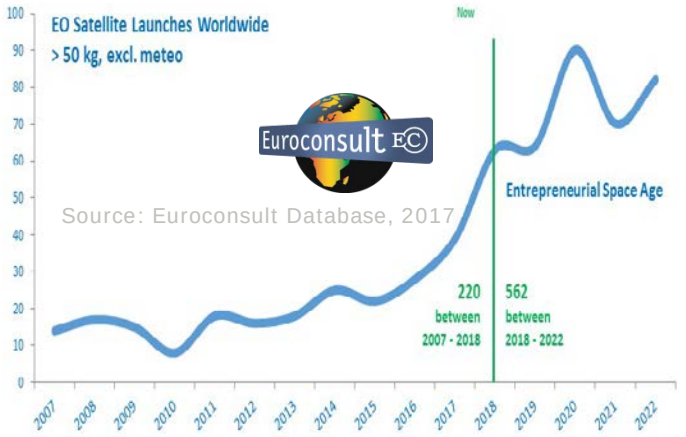
- Support Europe's independent utilisation of, and access to space through the provision of timely and accurate information regarding the space environment.

WG3: Earth Observation

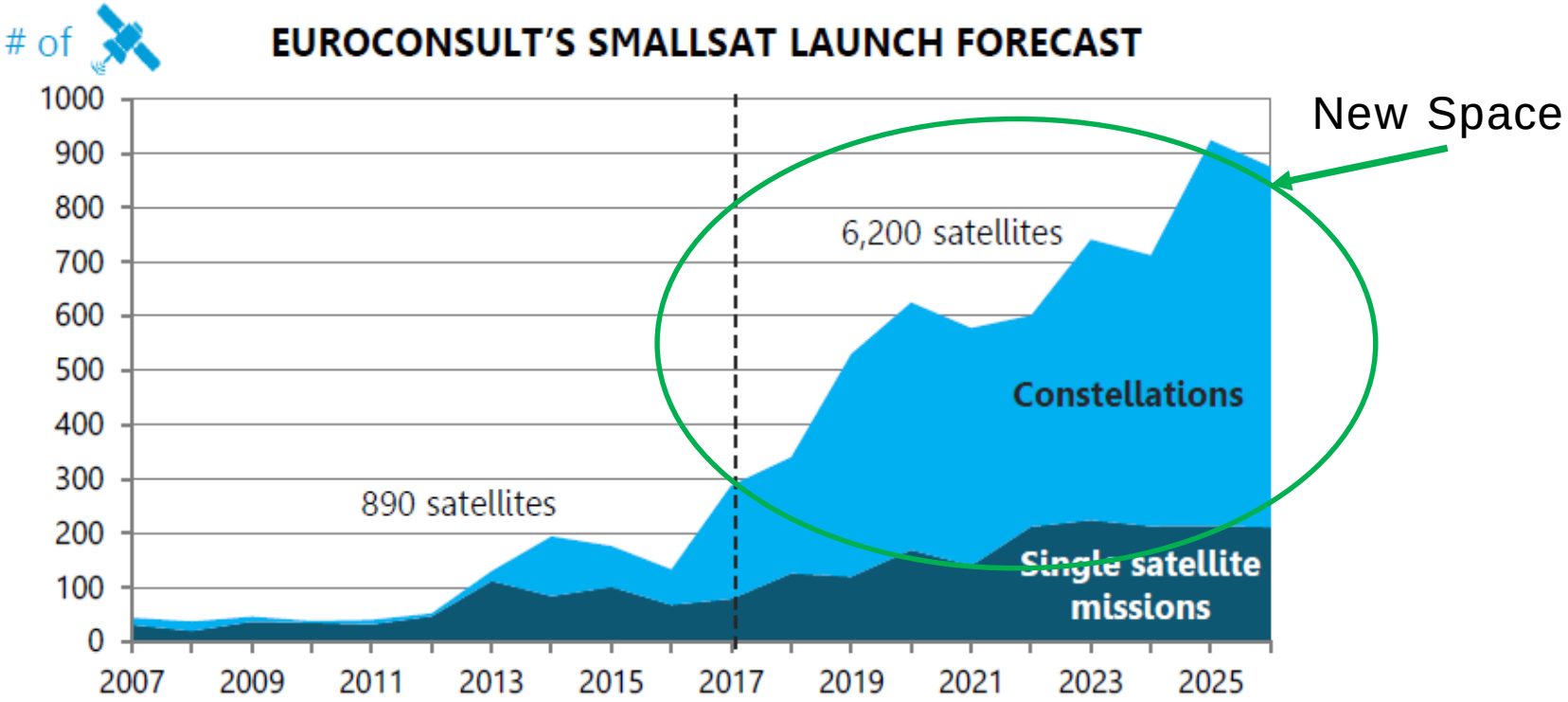
- “To provide dual use Ground Segment Interfaces to enforce the interoperability of multi-user and multi-sensor missions”



“More Eyes in the Sky”



New Space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EUROCONSULT'S SMALLSAT LAUNCH FORECAST
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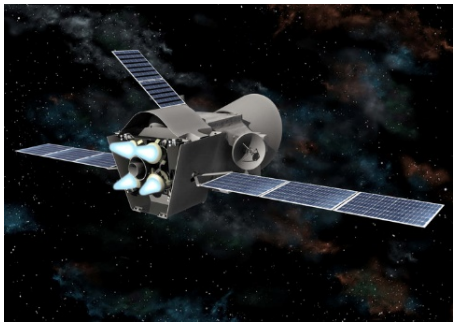
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
6,200 satellites
890 satellites
Constellations
Single satellite missions
New Space

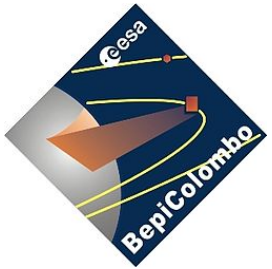
Classic Space versus New Space

Focus on Qualified Hardware

"Classic space", Scientific missions, Exploration, Earth observation, GEO telecom…

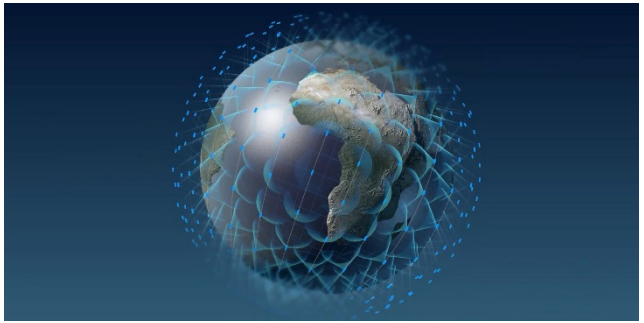
- Unique/ optimized designs
- High level of Product Assurance/ reliability
- High cost of parts - Low cost of ownership
- Risk mitigation by test





"New Space", Constellations, LEO…

- Increased use of COTS/ non-qualified parts
- Modular designs and reusability
- Serial Production methods
- Lower cost of parts – Higher cost of ownership
- Combination of risk mitigation techniques
- Schedule critical development



Focus on End User Requirements

New Space Task Force

New Players
+
Classical
Expertise

Standardisation Authorities

Industry

Space Agencies

Definition: Newspace

….. encompasses all the Space initiatives that revolutionize the commercial space field through the use of highly innovative solutions and processes, exotic business models, flat organisations, low-cost space with another risks management approach.

TASK FORCE OBJECTIVE

… to analyse the “New Space” context with regards to standardisation and propose, if necessary, evolutions in the actual set of ECSS requirements and associated Policies.

Conclusions

- Tremendous effort has been directed on upstream standards and these has reached a level of maturity.
- Downstream standardisation still requires more work and coordination.
- Collaboration among all the stakeholders on standards is leading to the reinforcement of the global competitiveness of the European Space industry.
- Industry dynamics is changing – working together is essential. Standards need to be updated and consolidated frequently to fit with the new emerging technologies and processes.
- The upstream and downstream standards are bringing together the experience and heritage of Classic space and the entrepreneurship of new space.

Thank you for your attention

Fore More Information see the Conference Brochure

or contact the JTC5 Secretariat:
Josef.Saurer@din.de

Additional Backup Slides

Overview of the JTC5 programme

Sectorial Dossier	JTC5 WG	Topic
1	WG 1	Navigation and Positioning (NP) Receivers for Road Applications and Airport Services – **LEAD IFSTTAR**
2	Handled by ETSI	Integration of Navigation and Positioning (NP) Applications with Telecommunications (TEL) ;
3	OPEN	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)
4	Handled by ETSI	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.
5	WG 5	Planetary protection- **LEAD ECSS/ESA**
6	WG 2	Space Situational Awareness (SSA) monitoring- **LEAD ESA**
7	WG 3	Dual use ground segment interfaces in Earth Observation (EO) – **LEAD DLR**
8	WG 3	Interfaces towards Earth Observation (EO) Downstream Services; Persistent Testbed, Conformance Testing and Fast Take Up Measures for EO Standards
9	Only Partly Handled by ETSI	Disaster Management
10	WG 4	Payload interfaces for launchers- **LEAD ECSS/ArianeGroup**

Still some downstream gaps

- **The following sectorial dossiers still need to be addressed:**

  Information Exchange/ data formating (inside and between Earth Observation (EO), Navigation and Positioning (NP), and Telecommunications (TEL)).

  Disaster Management (data transfer covered by ETSI) **Note:** This subject goes well beyond space applications