



Satellite Communications Consultation Event

Report and Executive Summary

Date of the Event: February 20th, 2008

Venue: Brussels (Centre Borschette, Rue Froissart, 36)

Editor:
Antonio Alfaro, Rose Vision

Table of contents

1. Introduction	4
1.1 <i>The ISI European Technology Platform</i>	6
2. Minutes of the Satellite Communications Consultation Event	7
2.1 <i>Morning session</i>	7
2.1.1 <i>Introduction</i>	7
2.1.2 <i>Role of Satellite Communications in the Global Network of the Future; elements for an Advanced European SatCom System (ISICOM); R&D priorities</i>	7
2.1.3 <i>ESA Telecommunications Long Term Plan (TLTP)</i>	8
2.1.4 <i>European Satellite Communications market review and user requirements</i>	9
2.2 <i>Afternoon Session- Focused Thematic presentations</i>	10
2.2.1 <i>Advanced satellite communications systems based on Future Internet principles</i>	10
2.2.2 <i>Innovative satellite communications systems and services for Security and Emergency Management</i>	10
2.2.3 <i>Integration between satellite communication and GMES</i>	11
2.2.4 <i>Towards the Network of the Future: Integration between Satellite and Terrestrial Communications Systems</i>	11
2.2.5 <i>Longer term R&D issues for the development of an Advanced European Satellite Communications System</i>	12
2.2.6 <i>Standards and Regulations for an Advanced European SatCom System</i>	12
2.2.7 <i>SatCom techno-economic aspects: growth areas in commercial applications, new emerging markets, socio-economic factors for institutional applications, dual-use spending efficiency</i>	13

2.3	<i>Outcome and proposals coming from the Consultation Event</i>	13
3.	<i>Summary of Proposals on R&D Priorities for ICT WP 2009-2010</i>	14
3.1	<i>System and Architectural Level</i>	14
3.2	<i>New Applications and Services</i>	15
3.3	<i>Interoperability, Interworking and QoS Provision</i>	15
3.4	<i>Radio Access Technologies</i>	15
3.5	<i>Innovative Global Operation Models, Global Regulatory and Spectrum Management Aspects</i>	16
3.6	<i>Impact of Next Generation ICT Components, Sustainability and Dependability.</i>	16
4.	<i>Annex I: Agenda of the Satellite Communications Consultation Event.</i>	17

1. Introduction

The European Commission, in cooperation with the ISI (Integral Satcom Initiative) European Technology Platform, organized the Satellite Communication Consultation Event on February 20th, 2008. The objective of this event was to bring together representatives from Institutions, Industries, Research Centers, User Communities and Academia in order to deal with the fundamental aspects which will drive the future evolution of European Satellite Communications.

The Satellite Communication Consultation Event was intensively supported by a wide number of participants and contributors representing European and Members States Institutions together with the main stakeholders of the Satellite Communication domain.

The structure of the event was divided into two sections. During the first one it was shown the relevance of the Satellite Communications for the entire Space sector. This aspect can be clearly appreciated in the ESA presentation through figures like the following ones:

- 20 out of 21 satellites placed in orbit by Ariane 5 and Soyuz in the last year are Telecommunications Satellites.
- More than 50% of the turnover of the European Satellite Industry corresponds to Telecommunications Satellites.

A further very important aspect that was illustrated is the complete integration and interoperability of satellite communications with the terrestrial networks: the complementary functionalities offered by satellite communications are important for the development of the Future Communications Networks.

Key European challenges can be faced and existing difficulties can be overcome thanks to an integrated approach with terrestrial and satellite communications moving ahead together.

The need to deal with satellite communications in a harmonized way and at European level (to avoid cost duplications and permit full inter-operability of services at European level) was clearly stated.

On the basis of the above considerations on the role of satellite communications, and the need to have a harmonised European approach, the ISI Chairman presented the ISICOM system concept. ISICOM (Integrated Space Infrastructure for global COMMunications) is intended to be the ISI proposal for an advanced Satellite Communications System fully integrated with the Global Network of the Future and able to complement Galileo and GMES by adding important functionalities. Fully compatible with the Future Internet principles, ISICOM will be a system of advanced next-generation GEO and LEO satellites with very high data rate telecommunications capabilities (including inter-satellite links). Furthermore, the global coverage of ISICOM will permit to exploit the system capabilities also outside

the European borders, for instance to permit European operations outside the EU and to assure security and enhance situation awareness by anticipating possible threats generating outside Europe.

The second section of the Satellite Communications Consultation Event was focused on the key aspects on which the satellite communications industry intends to devote considerable research and innovation efforts.

In this regard, strategic R&D priorities for the satellite communications industry field were presented, putting special emphasis on:

- Integration between satellite communications systems and terrestrial communications systems.
- Integration with the Future Internet infrastructure, with communications satellites intended as intelligent Internet nodes.
- Integration between Satellite Communications and Navigation (Galileo) and Earth Observation (GMES) systems.
- Innovative architectures and operational models to cope with global system coverage and operation
- Optical communications (e.g. advanced optical demodulation).
- Networking in the space; Inter-satellite Links, On Board Routing.
- Usage of high frequency bands.
- Adaptive resource allocation (ACM, adaptive power allocation).
- User terminals: develop low cost hybrid (satellite and terrestrial) terminals.
- High elaboration performance in radiation critical environments and component miniaturization.
- Low energy consumption and sustainable systems.
- Trust, secure and dependable system development.
- Advanced satellite and user terminal antenna systems (both reflectors and phased arrays).
- Quality of Service and dynamic resource and spectrum management.

In addition to this R&D challenges, it was also remarked the importance that should be paid to regulatory issues, licensing procedures, and spectrum harmonization at European level, considering that most of future satellite communications services will be provided at European (and Global) level and this can only be achieved if the regulatory framework is properly harmonized.

The European Commission, the European Space Agency and ISI agreed on the need of R&D developments in the satellite communications field in order to make it possible for the European

satellite communications and space industry to be one of the worldwide leaders. The R&D is to be fully integrated in the general (terrestrial) European ICT developments.

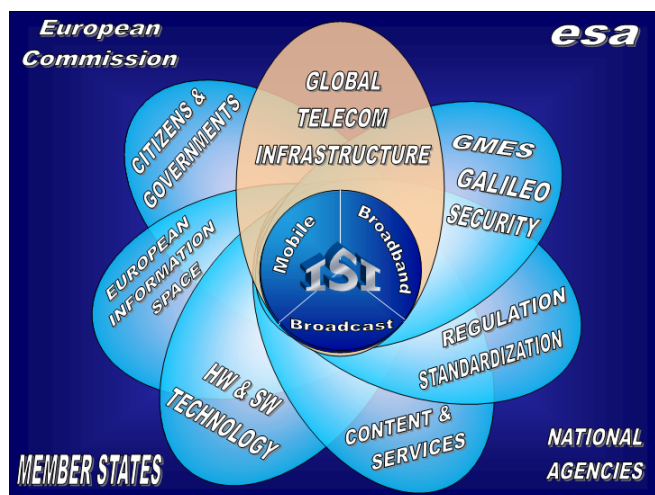
1.1 The ISI European Technology Platform

ISI is the European Technology Platform on Satellite Communications, whose membership embraces all relevant and interested private and public stakeholders from SatCom and the Space sector. Currently ISI involves more than 170 member organizations and 29 Countries.

The ISI European Technology Platform brings together for the first time in a unified, industry-led body all research, technology and innovation aspects related to satellite communications,

including mobile, broadband, and broadcasting applications. The purpose is to foster and develop the entire industrial sector, maximize the value of European research and technology development, and contribute to EU and ESA policies.

During the last 3 years, ISI has defined and updated the Strategic Research Agenda for Satellite Communications, working continuously for the development of SatCom sector in Europe through the promotion of R&D and addressing main challenges that Europe SatCom sector is facing.



2. Minutes of the Satellite Communications Consultation Event

2.1 Morning session

2.1.1 Introduction

The main aspects driving the development of the Future Communications Networks have been summarized, including:

- True ubiquitous broadband networks based on the integration and inter-operability among different systems, networks and technologies complementing each other.
- Networks and services developments based on Future Internet principles
- European harmonisation of R&D activities aiming at reinforcing European leadership at worldwide level
- Need for harmonized regulation and spectrum approach permitting co-existence of satellite and terrestrial systems
- Potential for new applications markets of satellite communications integrated with terrestrial systems

Within the ICT domain, terrestrial communications systems and satellite communications systems shall cooperate to permit Europe to play a key role in the worldwide dimension. In particular, it was highlighted the relevance of the current process of elaboration of the FP7 ICT Work Programme 2009-2010, the Satellite Communications Consultation Event being one important input to this process.

During this event, the European satellite communications community met to clarify why investing in SatCom R&D is a key for Europe strengthening, and identify which should be the R&D priorities considered essential for the Satellite Communications evolution in Europe in a synergic way with respect to terrestrial system development.

2.1.2 Role of Satellite Communications in the Global Network of the Future; elements for an Advanced European SatCom System (ISICOM); R&D priorities

The important proposals presented are the results of more than three years of continuous work of the Integral Satcom Initiative (ISI) platform supporting research, technological evolution and innovation activities in satellite communications arena.

The satellite communications area is a key element of the Global Network of the Futures and is able to provide important contributions to deal with some of the main risks that Europe is facing: security threats, disaster management and the ubiquitous access to ICT infrastructures and services can be mentioned.

The basic consideration is the adoption of a European harmonized approach and on this basis ISI has elaborated the proposal for the development of a European integrated and advanced satellite communications system: ISICOM (Integrated Space Infrastructure for global COMMunications). The development and implementation of ISICOM will necessitate a consistent R&D roadmap and the combined and coordinated contribution of European Commission, European Space Agency and National Space Agencies. In addition to being fully inter-operable with terrestrial communication systems, ISICOM will be integrated with GMES (permitting real time availability of remote sensing information at worldwide level) and Galileo (adding further functionalities to the satellite navigation system, like synchronization enhancing and dynamic management of Galileo satellites, together with the possible development of integrated COM/NAV user applications). To develop ISICOM it will be extremely important to continue and strengthen the cooperation with the other ICT related European Technology Platforms (ETP), Already started is the cooperation with NESSI, NEM and eMobility concerning Future Internet, where the ISICOM satellites are to be integrated as intelligent nodes and not only as “cables in the sky”, and other possible cooperation areas are envisaged (e.g with the Photonic 21 ETP on advanced optical demodulation issues, and wit other ETPs in the areas of high performance computing elaboration in radiation critical environments and components miniaturisation).

The satellite communications R&D main priorities were also summarised (as already mentioned in chapter 1 of this report and further detailed in chapter 3).

2.1.3 ESA Telecommunications Long Term Plan (TLTP)

ESA presented the TLTP and offered some really convincing arguments in order to demonstrate why satellite communications are an essential part of the space sector. Some of these arguments can be summarized in the following statements:

- 20 out of 21 satellites placed in orbit by Ariane 5 and Soyuz in the last year are Telecommunications satellites. (*Source: Arianespace ad. Via satellite, Space News. Feb 2008*)
- More than 50% of the turnover of the European satellite Industry corresponds to Telecommunications satellites. (*Source: Eurospace 2007*).

Without telecommunications satellites, the entire space industry would not be sustainable, so R&D investments permitting future development of the satellite communications technologies are deemed essential.

The draft ESA Telecommunications Long Term Plan separates the developments to be made into two different market segments,

- commercial market segment (Broadcast Services, Fixed Services, Mobile services, Broadband Access, Broadcast mobile)
- institutional market segment (Air Traffic Management, Data relay System, Security and Interplanetary Communications).

A number of key activities are considered, including (non exhaustive list):,

- Flexible payloads design and development, for different frequency bands
- Support to ground segment developments in line with more complex user requirements
- Design of the European component of next generation Global LEO mobile Advanced on board processing architectures
- Cryptographic and anti-jamming systems for security applications
- Radiation hardened components
- Optical communications improvements; Active antennas for multiple access systems either in optical or in EHF

2.1.4 European Satellite Communications market review and user requirements

In relation to social issues, which are deemed to be of the utmost importance since technology evolution shall be “user driven”, it is essential to analyse the social impact of ICT technologies and services, properly identify the priorities for citizens today and, once having identified the users needs, deal with the technologies that better address these needs.

The main user priorities can be classified in the following 10 bullet points:

- More communications (real-time, unified, invisible, intelligent, content-rich)
- Dependable and reliable communications (avoid creating Achille’s heel)
- Open access (global coverage, low cost, unlimited access to information)
- Security and stability
- Public protection and disaster relief
- Location and ambient awareness
- Environmental impact
- Energy impact (avoid global warming)
- Synchronization of selected information

- Simplicity

ISICOM will be able to address all these issues, thus highlighting the user perspective background on the basis of which the ISI proposal for such an innovative European Satcom system has been conceived.

2.2 Afternoon Session- Focused Thematic presentations

The afternoon session has been organized in focused thematic presentations in order to deal with specific areas of particular importance within the satellite communications arena and considered to be essential for the ISCOM development.

2.2.1 Advanced satellite communications systems based on Future Internet principles

The satellite communications should be integrated from the very beginning in the future development of the IP standardization process, in order to make easier the integration of SatCom into Future Internet and avoid future incompatibility problems.

The main challenges in relation to the Future Internet Network (global & reliable connectivity anywhere & anytime, sustainability & dependability and finally, security and trust) require putting special emphasis on the key importance of the interoperability of different technologies, both terrestrial and satellite based. Future Internet network should take advantage of all available technologies and all the benefits that each one can bring to this fundamental Future Network.

2.2.2 Innovative satellite communications systems and services for Security and Emergency Management

Satellite Communications may complement in different ways and add value to homeland security systems. Furthermore, some highly valuable innovative computer simulations were illustrated, permitting to clearly describe the operational scenario under different conditions and enabling a powerful and useful interaction between the security system designer and the security system final user, through which the full understanding of the complex user needs will be obtained.

Satellite communications capabilities are essential for disaster recovery solutions. The future trends in satellite communications and the role that these evolutions can play in the security domain (smaller cells with bigger interaction and dynamic management, on-board technologies, Mobile Satellite Technologies, etc.) were mentioned.

The main application areas within the security arena, all of them benefiting from satellite communications capabilities, are as follows:

- *Citizens protections*

- *Critical infrastructure protection (transport, telecommunications, energy, and other infrastructures)*
- *Crisis management and disaster reaction*
- *Border surveillance*
- *Protection from terrorism*
- *Early warning, detection and extended situation awareness*

These applications can be suitably served by satellite communications, devoting special emphasis on the relation between the user needs to be satisfied and the necessary satellite communications R&D developments that will enable technologies and services to properly address such users needs.

2.2.3 Integration between satellite communication and GMES

The main areas in which Satellite Communications can add important functionalities and capabilities to the GMES system, fully addressing GMES Telecommunications needs are the following,

- *Faster and optimized raw data collection to enhance reactivity of GMES service providers (thus permitting improved exploitation of GMES EO satellite fleet)*
- *Dissemination of products wherever and whenever needed*
- *Reconfigurable, flexible and robust to disaster systems (key for security applications)*

One main challenge is to efficiently integrate the satellite communications (current and future technologies and services) within the GMES architecture in a fully integrated and inter-operable way with respect to terrestrial systems. New solutions are required to cope with specific GMES needs, in particular Data Relay and S-band two way Geo-mobile systems. ISICOM will enable to meet telecom related needs of the GMES user communities.

2.2.4 Towards the Network of the Future: Integration between Satellite and Terrestrial Communications Systems

Satellite communications is a key element of the Future Networks as for example within the 4G systems domain. However, some challenges shall be faced: integration of satellite systems with terrestrial networks is a of course a key challenge, but shall also be complemented by a proper analysis and definition of 4G terminals, IP global infrastructure, spectrum usage and other related issues.

A particular study case where integration between satellite and terrestrial networks is an ideal framework is broadband communications on board trains. Once having analysed the background situation in this particular case and the evolution that the broadband access on board trains has followed, some lessons can be extracted for future developments. Interoperability is again the key

aspect that should be considered in future developments, e.g. flexible and spectrum efficient radio access, optimized protocols and routing via the interworking of satellite and terrestrial wireless, access with standard equipments, optimised traffic processing, scalability.

2.2.5 Longer term R&D issues for the development of an Advanced European Satellite Communications System

The main long term research visions, drivers, trends and challenges to be considered for the proper development of ISICOM system include the following:

- environmental impact and sustainability of Future ICT Networks,
- optimal spectrum usage,
- integration of satellite communications in the future Internet Protocols,
- increase of security functionalities,
- consistent cost reduction (low cost terminals),
- higher bit rates and bandwidth efficiency.

2.2.6 Standards and Regulations for an Advanced European SatCom System

Some spectrum and regulatory threats were identified, impacting on Satellite Communications system evolution, such as the different uses of the same frequency band in different Countries and the substantial satellite spectrum lost over the last few years. All these threats must be taken into account and solved, since hybrid satellite/terrestrial solutions offer unique advantages over terrestrial-only systems. Some recommended approaches could be:

- Reconsider spectrum, technology and R&D policies in favour of more hybrid satellite/terrestrial use of spectrum.
- Strongly protect priority of satellite services in frequency bands where sharing is not demonstrated as feasible

The attention was brought to the importance that regulatory framework, including standardization processes and spectrum management, has for any future system that will be launched at a pan-European or world-wide level (and this is of the utmost importance for a European system with global coverage and capabilities like ISICOM). In parallel to the needed R&D developments it is essential to make sure that the legal and regulatory framework is adapted and optimized for the Network of the Future that Europe is designing, otherwise R&D developments potential could not be totally exploited, or even, in some cases, may become useless due to the difficulties found at implementation level.

2.2.7 SatCom techno-economic aspects: growth areas in commercial applications, new emerging markets, socio-economic factors for institutional applications, dual-use spending efficiency

A general vision is needed in terms of the techno-economic aspects of satellite communications applications. Considering the three main areas of the Space domain, Communications, Earth Observation and Navigation, the communication services and applications appear to be the most important one in terms of economic value and referring to the entire value chain. This fact is again showing the importance of investing in R&D activities in the Satellite Communications field.

From an operator point of view, it was mentioned that a purely terrestrial system based offer, not complemented by satellite capabilities, does not allow digital services such as innovative TV solutions, broadband internet access in remote/rural areas, mobile broadband and security/emergency applications. A fact is that satellite technologies and services have driven innovation in Europe, being pioneers in making available services such as digital television or HDTV, showing in this way the importance of supporting SatCom R&D developments.

2.3 Outcome and proposals coming from the Consultation Event

During the Consultation Event it was shown that there is a need and a social requirement for Satellite Communications, as highlighted by all the stakeholders during the event. The new concept of ISICOM and a number of associated research challenges for the Satcom community have been widely endorsed at the occasion of this event. There is a general demand from the Satcom community, including operators, service providers, manufacturers and users, that the **future FP7 ICT WP 2009-1020 should include specific topics related to R&D for Satcom technologies and services.**

The Event participants agreed that the dialogue and cooperation among the EC, ESA and ISI will facilitate the incorporation of key research topics, challenges and objectives related to satellite communications field within the FP7 and ESA research programmes.

3. Summary of Proposals on R&D Priorities for ICT WP 2009-2010

The Satellite Communications Consultation Event and its conclusions were supported by the wide audience that attended the event, representing all different stakeholders from the SatCom sector, including Institutions, Industries, Operators, Manufacturers, Users, Service Providers, Research Centers and Academia.

During the Event the key R&D challenges that SatCom industry is facing have been presented. In this regard, special emphasis is posed on the following priority R&D themes proposed by ISI for inclusion in the ICT Work Programme 2009-2010:

3.1 System and Architectural Level

- The Network of the Future shall foresee heterogeneous and flexible architectures for true provision of ubiquitous broadband connectivity and broadcast services by means of a layered approach fully integrating large coverage Global/European macro-cells down to indoor pico-cells into one unique and fully interoperable network. Aspects deserving particular attention are:
 - Integration between satellite communications systems and terrestrial communications systems.
 - Integration with the Future Internet infrastructure, with communications satellites intended as intelligent Internet nodes and not only “cables in the sky”;
 - Integration between Satellite Communications and Navigation (Galileo) and Earth Observation (GMES) systems
 - Innovative architectural studies, starting from detailed user requirements definition, for advanced global communications systems. Hybrid GEO/LEO/ISL architectures for high data rate provisioning and global operation
 - Networking in the space; Inter-satellite Links, IP On Board Routing. High data rate Optical Communications (utilizing advanced optical demodulation)
- Software Defined Radio technologies are of high importance to extend the lifetime, the flexibility and the level of adaptiveness of the future network infrastructure and user terminals.
- Cognitive Radio and Dynamic Spectrum Management technologies are equally important to achieve the paradigm of optimally connecting each user terminal by selecting the most appropriate radio access technology depending on the location, the required QoS class and the status of the network. They will also be key to the sharing of frequency bands between satellite and terrestrial operators in the network of the future.
- Extended Satellite Line-Of-Sight architecture. With the advent of a plethora of new wired and wireless technologies, the satellite link should not be based exclusively on the physical line-Of-

Sight reach but extended to cover the end connection between the Earth Station and the additional devices.

3.2 New Applications and Services

User demands encompass a wide range of services in various environments, ubiquitous access to broadband Internet and other communications infrastructures wherever and whenever necessary, thus relevant Users groups and applications include:

- Citizens and Institutions (e.g. for security protection and quick disaster relief)
- Individual users and user clusters on the Move:
- Users in areas with little infrastructure and/or under emergency/critical situations

New and legacy applications will require enhanced context awareness, ubiquity, and consequently a higher degree of interaction or even integration at the network and application levels.

3.3 Interoperability, Interworking and QoS Provision

In order to allow fully interoperability and interworking among the largest set of different radio access technologies, the network of the future should foresee:

- a global QoS concept overcoming the inherent differences at data link (e.g. data rate, delay and jitter) and system level (e.g. resource allocation strategies, mobility management) of the different radio access technologies.
- dynamic and reconfigurable traffic flow management strategies according to a cross layer philosophy;
- suitable mobility management algorithms, ensuring horizontal and vertical seamless handover functionalities; ways to improve the mobile ad-hoc network latency, capacity and robustness by introducing an overlay to the network
- advanced solutions for the protection of the transmitted information to be implemented on top of each individual radio access technology, thus exploiting link diversity at maximum level
- innovative cryptographic and anti-jamming solutions for security applications

3.4 Radio Access Technologies

Investigation in the field of specific radio access technologies shall take into account the state-of-the-art achieved so far by each of them. Technological solutions which can be considered as fully mature for a specific subset of radio access technologies might be totally novel for other subsets.

R&D in this field should target the ambitious goal of achieving a higher level of synergy between different radio access technologies by maximising the spread of the most advanced and well performing solutions currently employed within each subset in order to minimise gaps in terms of data rate and QoS provision.

In the light of the above, the following non-exhaustive list proposes specific priorities relevant to the ISI community:

- Enhanced Multiple Access and Multiplexing Schemes based on MIMO-OFDM technologies
- Cooperation with Cognitive Radio systems allowing off-loading

- Position-Assisted Synchronisation and channel estimation techniques, to allow reliable reception at lower SNR Radio Access Technologies operating point.
- Advanced Multi-User Detection and Interference Cancellation, to improve the reverse link performance.
- Higher Order Modulations, to improve the spectral efficiency.
- Adaptive Fade Mitigation Techniques, to allow exploitation of higher frequency bands, characterised by deep fades due e.g. to atmospheric impairments.
- Cooperative Coding and virtual MIMO, to improve the air-interface efficiency and overcome battery limitations in case of handheld terminals.
- User terminals aspects: development of low cost hybrid (satellite and terrestrial) terminals; advanced antenna systems (both reflectors and phased arrays).

New and legacy applications will require enhanced context awareness, ubiquity, and consequently a higher degree of interaction or even integration at the network and application levels.

3.5 Innovative Global Operation Models, Global Regulatory and Spectrum Management Aspects

- Innovative operation and management models to cope with Global system coverage and operation
- Regulatory framework harmonization at European and Global level, including both satellite and terrestrial components licensing procedures.
- Spectrum usage harmonization at European and Global level.
- New sharing mechanisms to facilitate the re-use of spectrum mainly between satellite and terrestrial networks and terminals. Intelligent mitigation techniques in addition to new sharing concepts should be developed to exploit the scarcity of spectrum and allow Satellite based systems to use the bands where terrestrial networks operate

3.6 Impact of Next Generation ICT Components, Sustainability and Dependability.

- Low energy consumption and sustainable systems: communication satellites, by using power provided by the sun, can contribute to deal with energy consumption and sustainability aspects.
- High elaboration performance in radiation critical environments and component miniaturization are important aspects to deal with in designing innovative systems
- Trust, secure and dependable system development are made possible by the new hybrid (terrestrial and satellite) architectural approaches

4. Annex I: Agenda of the Satellite Communications Consultation Event.

Satellite Communications Consultation Event

February 20th, 2008 ; Brussels - Centre Borschette

Agenda

Registration

09h30-10h00 Registration

Morning Session

10h00-10h30 **Welcome and Introduction**

Rainer Zimmermann, Head of Unit “Future Networks” Directorate-General Information Society and Media; European Commission

10h30-11h15 **“Role of Satellite Communications in the Global Network of the Future; elements for an Advanced European SatCom System (ISICOM); R&D priorities”**

Vincenzo Fogliati, ISI Chairman

11h15-11h30 Coffee Break

11h30-12h00 **“The ESA Telecommunications Long Term Plan”**

José Maria Casas, Senior Advisor on Telecommunications & Deputy Head of the Telecommunications Department - European Space Agency

12h00-12h45 **“European Satellite Communications market review and user requirements”**

Prof. Giovanni Corazza, Former ISI Chairman

12h45-14h00	Lunch Break
Afternoon Session	Focused Thematic Sessions
14h00-14h20	<p>“Advanced satellite communications systems based on Future Internet principles”</p> <p>M. Mazzella, Thales Alenia Space; B. Collini-Nocker, University of Salzburg; R. Brough, Logica CMG</p>
14h20-14h40	<p>“Innovative satellite communications systems and services for Security and Emergency Management”</p> <p>A. Saitto/F. Rispoli, Telespazio; P. Fauroux/M. Piccinni, Thales Alenia Space; C. Pérez/ D.Gimenez, Isdefe</p>
14h40-15h00	<p>“Integration between SatCom and GMES”</p> <p>J. F. Charrier/B. Laurent, EADS-Astrium</p>
15h00-15-20	<p>“Towards the Network of the Future: Integration between Satellite and Terrestrial Communications Systems”</p> <p>G. Corazza, University of Bologna; S. Scalise, DLR</p>
15h20-15h40	Coffee Break
15h40-16h00	<p>“Longer term R&D issues for the development of an Advanced European Satellite Communications System”</p> <p>E. Lutz, DLR; B. Evans, University of Surrey</p>
16h00-16h20	<p>“Standards and Regulations for an Advanced European SatCom System”</p> <p>J. Sesena, Rose Vision; A. Vandenbroucke, ESOA; D. Hartshorn, GVF</p>
16h20-16h40	<p>“SatCom techno-economic aspects: growth areas in commercial applications, new emerging markets, socio-economic factors for institutional applications, dual-use spending efficiency”</p> <p>R. Villain, Euroconsult; C. Leurquin, SES</p>
16h40-17:00	<p>Wrap up and conclusions</p> <p>Rainer Zimmermann, Head of Unit “Future Networks” – European Commission - DG INFSO;</p> <p>Vincenzo Fogliati, ISI Chairman</p>