

MINUTES OF THE 20th CEOS PLENARY MEETING

14th-15th November 2006
Buenos Aires

Draft

*Comment sent
1/9*

1. Welcome and introduction

The Chairman, Conrado Varotto, opened the meeting and welcomed participants to the 19th CEOS Plenary. Paula Freedman (BNSC) and Barbara Ryan (USGS), addressed the Plenary as part of the Troika. Then, Minister of Foreign Affairs of Argentina, Jorge Taiana, addressed the participants and highlighted the importance of Earth Observations.

2. Review of agenda

The proposed agenda for the meeting was adopted.

3. Membership issues

TUBITAK-UZAY (Turkey)

The Chairman, Conrado Varotto, noted the application of Tubitak-Uzay (Space Technology Research Institute of Turkey), an institution of the Scientific and Technical Research Council of Turkey, to become a Member of CEOS, and invited Mr. Erol Tunali to make a presentation on the activities of the organization.

Mr. Tunali's presentation summarized the activities of Tubitak-Uzay in Earth Observation. Since 1998, it has a Satellite Technology Group that has worked in the development of an EO LEO Mission, BILSAT-DMC, together with SSTL of Surrey University. The satellite is part of the Disaster Monitoring Constellation (DMC) and participates in the Charter of Space and Major Disasters. The group also has under development RASAT that will be the first satellite designed and manufactured developed in Turkey.

The motion for acceptance of Tubitak Uzay was seconded by ESA and endorsed by BNSC, NASA and INPE. Considering it fulfils all the requirements for Full Membership, Tubitak Uzay were application was accepted.

4. Review of 19th Plenary – Status of Actions

Ana Medico (CONAE) reviewed the status of the Actions from the 19th Plenary and the CEOS Task Force Report.

No.	Action	Due Date
19-1	CEOS Chair to convey the acceptance and appreciation of CEOS in letters to USGS and CSIR in response to their offers to serve as CEOS Chair agency in future years	December 2005 Complete
19-2	CEOS Chair, supported by SIT Chair and CEOS	Complete

	SEC, to develop an agenda item for 20th CEOS Plenary on possible further amendments to the Terms of Reference of both CEOS and SIT	Agenda Item 7 Led by USGS as incoming Chair
19-3	SIT Chair to work with CEOS WG Chairs to review final details of the amended Terms of Reference of the Working Groups – the general principles of which have been endorsed by 19th CEOS Plenary. This review should be in the context of an evaluation of the continued applicability of the CEOS WG Structure in light of the interface with GEO.	Complete WGISS and WGCV have proposals for updates. Further changes pending outcomes of 20 th Plenary.
19-4	SIT Chair to take account of the CEOS WG Recommendations to 19th CEOS Plenary when reviewing WG structure, terms of reference, and tasking in support of the CEOS Implementation Plan. WG capacity to undertake the required CEOS Implementation Plan tasks should also be considered.	Ongoing
19-5	CEOS Chair to oversee execution of the various actions agreed by 19th CEOS Plenary to implement the recommendations of the CEOS Task Force	20th CEOS Plenary Complete
19-6	CEOS Principals to send comments on V2.0 of the GEO 2006 Work Plan to SIT Chair – who will prepare a consolidated CEOS position on the Plan for GEO-II	Complete
19-7	CEOS SEC to finalise proposed CEOS representation to the various GEO Committees which are envisaged	December 2006
19-8	CEOS Chair and SIT Chair to express willingness of CEOS at IGOS-P-12bis to participate in a joint CEOS/IGOS-P side-event at CSD in 2006	Complete
19-9	CEOS Chair to draft a CEOS resolution that embeds the SFCG Resolution on WRC-07 objectives, and all CEOS agencies encouraged to employ the resolution in their lobbying activities with their respective national/regional authorities	January 2006 Draft distributed for approval at 20 th Plenary
19-10	BNSC, supported by CEOS SEC, to cooperate with SFCG to deliver a short strategic assessment of the impact of spectrum loss on satellite Earth observation and the priorities for frequency protection to be undertaken for 20th CEOS Plenary. BNSC and SFCG encouraged to seek feedback from all CEOS agencies in undertaking the assessment in 2006.	20th CEOS Plenary BNSC-led study for SFCG will report to Plenary.

19-11	SIT Chair to consider how the proposed CEOS/SFCG assessment might be applied in support of the related frequency protection task in the GEO 2006 Work Plan and ensure appropriate linkages are made	Complete BNSC-led study for SFCG will report to Plenary. GEO SEC Director is present and will ensure required linkages
19-12	SIT Chair to circulate the proposed calendar for 2006 to all CEOS agencies after consultation with CEOS SEC	Complete

**Actions arising from the report of the CEOS Task Force
DRAFT FOR COMMENT**

No.	Action	Due Date
CTF-1	CEOS Chair to add a cover letter to the statement of support from space agencies for CEOS endorsed by 19 th Plenary and to send the statement to those agencies who have not been actively involved in CEOS activities in recent years, encouraging them to re-join the effort and indicating resolve within CEOS for a new way of doing business.	December 2005 Complete
CTF-2	CEOS Chair, with assistance of CEOS Secretariat, to contact all CEOS agencies CEOS Chair at 19th Plenary to identify possible new entrants to CEOS, to pursue promising leads during the year, and to prepare a report for 20 th Plenary.	20th CEOS Plenary Report to Plenary
CTF-3	SIT Chair should supervise the production of a draft <i>CEOS Implementation Plan</i> for submission to 20th Plenary. 3 elements are envisaged for the Plenary submission: Task A (short term): a response to the GEO 2006 Work Plan Task B (medium term): a response to the GCOS IP for COP-12 (The Climate Chapter of the CEOS Plan) Task C (long term): an implementation framework for the CEOS inputs to GEOSS	Ongoing Status Report prepared for Plenary
CTF-4	SIT Chair to draw attention of the GEO Secretariat to the recommendations of the CEOS Data Utilisation Task Force.	Complete
CTF-5	CEOS Chair, as Co-Chair of IGOS-P should make it clear at the next Partners' meeting that the changes initiated by CEOS in response to the CTF report will not impact CEOS commitment to the IGOS Partnership	IGOS-P-12bis Complete

CTF-6	Whilst delegating day to day contact with GEO to the Chair of SIT (supported by the Chairs of the CEOS Working Groups), the CEOS Chair will ensure that there is an effective interface between CEOS and GEO.	Complete
CTF-7	SIT Chair to ensure that the WG Chairs are clear about the direction for the WG programme and the specific tasks which have been allocated to them (specifically CEOS Implementation Plan targets). SIT Chair to regularly consult with WG Chairs to be able to fully utilise the expertise that exists within the CEOS WGs.	Complete
CTF-8	Working Groups Chairs should be actively engaged in development of the relevant parts of the CEOS Implementation Plan. Working Group Chairs to plan their activities and meetings to best meet the needs of the CEOS implementation plan targets allocated to them, and should report progress regularly to Chair of SIT.	Ongoing
CTF-9	Working Group reports to Plenary should focus on CEOS implementation plan activities but include R&D activities as appropriate.	Ongoing
CTF-10	Once the conclusions of the review of CEOS Working Groups are clear, SIT Chair to write to CEOS Principals to encourage them to review their agency's membership to CEOS Working Groups in order to provide them with the necessary expertise and resources to accomplish their work.	Pending WGISS Chair report echoes this request
CTF-11	CEOS Chair, supported by Troika members, to encourage the maximum senior level attendance at the 20 th CEOS Plenary and to ensure a suitably attractive agenda.	20 th CEOS Plenary
CTF-12	CEOS Chair to update the draft CEOS resource plan for presentation to 20 th Plenary	20 th CEOS Plenary

5. Chair's report

Conrado Varotto (Chair) addressed the Plenary regarding the activities of 2006, and specially highlighting the efforts carried out during the year to ensure that CEOS becomes the space branch of the Global Earth Observation System of Systems (GEOSS).

In particular, he referred to the governance issue that CEOS has been working on in this transition period, and the changes that derived from the CEOS Task Force Report, mainly, the strengthening of the role of the SIT Chair. During 2006, SIT has had a more outstanding role, since it has had the responsibility of monitoring the development of the CEOS Implementation Plan for GEOSS.

He also made reference to the new approach being proposed by the incoming Chair, Barbara Ryan (USGS), which calls for a stronger structure of the committee and the creation of new roles.

During 2006, the Chair represented CEOS at major international meetings, and personally committed to participate in major CEOS meetings to work on the way forward of the committee, especially regarding the CEOS response to the GCOS Implementation Plan, which has been ably led by Dr. Barbara Ryan from USGS, and the SIT meetings in relation to the elaboration of the Long Term Implementation Plan.

In particular, the Chair saw great potential in the concept of the Constellations and looked forward to continue participating in them.

Also, with reference to the Working Group activities, right after the Plenary, CONAE hosted, in the frame of the WGEdu program, the Jay Feuquay Workshop for High School teachers, with the sponsorship of USGS and ESA, and, simultaneously, a meeting as in continuation of the capacity building Workshop for Water Resources for Latin America, that was held in Argentina in 2005.

6. Report on development of the CEOS Implementation Plan

Volker Liebig (ESA/SIT Chair) gave an overview of the work of SIT during the year, then presentations were made for each specific issue.

a) Overview (SIT Chair)

Volker Liebig (SIT Chair) made a presentation reviewing the status of the tasks agreed upon in the 19th Plenary for the development of the CEOS IP, as a result of the analysis made by the CEOS TF.

He thanked the collaboration of space agencies during the year to contribute to the efforts of SIT in turning CEOS into the space arm of GEO and emphasized the importance of the continuing support of space agencies to these efforts.

SIT Agenda for 2006 comprised three tasks:

A (Short Term): Response to GEO 2006 Work Plan

B (Medium Term): Response to GCOS Implementation Plan to be presented at COP-12

C (Long Term): Elaboration of an implementation framework.

SIT has worked on strengthening the relationship with GEO Sec and on preparing a mechanism for CEOS contribution to GEOSS, the CEOS Constellation Concept.

SIT responsibility is to oversee the development of the CEOS Implementation. In this respect, the SIT Chair informed that a provisional outline had been distributed to Principals for their comment ahead of the 20th Plenary.

The proposal for the plan consists of three parts:

Part I: Introduction and Background

- Purpose of the IP and role of CEOS as primary co-ordination body for GEOSS space segment
- Explanation of the GEO process and structure and of the GEOSS 10-Year IP

- Description of the GEOSS space segment: A summary of the 2, 6, and 10-year targets for implementation of the space segment of the GEOSS – broken-down by SBA. This section should build on the preliminary analysis by JAXA.

Part II: CEOS Implementation Plan – by SBAs

- A detailed inventory of all actions identified as necessary for realisation of the GEOSS space segment targets for each of the SBAs: *Disasters, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture & Desertification, Biodiversity*
- including details of milestones, responsibilities, participation, and approach.

Part III: Implementation Plan Status (to be updated annually)

- A concise and insightful summary of the overall state of progress by space agencies versus the 2, 6, and 10-year targets identified in Part I – and an indication of which areas require particular attention for the coming years and what actions by which agencies are necessary
- A summary table or graphic of progress against each action – eg including action status, percentage of progress achieved, anticipated completion date, obstacles to be addressed
- A report on progress in the preceding year – highlighting particular achievements and problems and their implications for the realisation of the space segment targets
- A plan for action for the forthcoming year – highlighting priorities, anticipated difficulties, responsibilities and milestones

Plenary participants were invited to send comments to SIT regarding this proposal by November 30th.

b) CEOS Response to GEO Work Plan (2006& 2007/9)

Jean Louis Fellous (SIT Team) summarized the advances so far. After a period of revision and consultations, the final version of GEO Work Plan 2006 was approved by GEO Executive committee in April 11 2006, comprising 96 tasks.

For the WP 2006, CEOS was listed as Lead and Point of Contact in 4 Tasks:

- Climate, Key Data from Satellite Systems: CL-06-02 (CEOS/USGS – Barbara Ryan)
 - co-Leads: USA, WMO
- Land Multispectral Imager Continuity: AR-06-09 (CEOS/USGS – Larry Pettinger)
 - co-Leads: USA, GTOS
- GPM (Global Precipitation Monitoring) Mission Implementation: AR-06-10 (CEOS/JAXA – Chu Ishida)
- GEOSS Quality Assurance Strategy: DA-06-02 (CEOS/WGCV – Stephen Ungar)
 - co-Lead: IEEE

As Co-Lead or Contributing Organization, CEOS was also listed in:

- Co-Lead: DI-06-01 (Lead: IOC), DI-06-12, CB-06-01 and 03 (Lead: NL)
- Contributing Organization: DI-06-05, 09, 10, 14; HE-06-03; CL-06-01, 03, 05; WA-06-04, 05, 06, 07; WE-06-01, 02, 04, 05; EC-06-01, 02, 03, 07; AG-06-03, 04, 07; BI-06-04, 05; US-06-03; AR-06-05, 11; DA-06-04, 09; CB-06-02, 04 (GeoNetCast); OR-06-01.

Between April 11 and Nov 1st, the GEO Work Plan 2007/2009 was prepared and presented for revision prior to its approval at GEO IV in Bonn, on November 28-29. The main features in the new WP are that it has refined and streamlined the tasks listed, resulting in a total of 72 Tasks(50

Tasks to be continued from WP 2006, including 10 tasks corresponding to supporting activities, and 32 new tasks proposed). The plan aims at engaging new components and communities, establishing the basic policies to build the system of system, and basically enlarging the base for GEO/GEOSS.

Regarding tasks for which CEOS has been fulfilling a role either as lead or contributor, many of them have been either completed or merged into other tasks.

CEOS-led remaining tasks are CL 06-02 and DA 06-02.

Tasks with CEOS as Co-Lead or Contributing organization:

Continued: DI-06-09, HE-06-03, CL-06-01, CL-06-03, CL-06-05, WA-06-05, WA-06-07, WE-06-01, WE-06-02, WE-06-05, EC-06-01, EC-06-02, EC-06-07, AG-06-04, AG-06-07, AR-06-11, DA-06-04, DA-06-09, CB-06-04 (GeoNetCast).

Continued as ongoing supporting activities (GEO Secretariat): DI-06-10, US-06-03.

CEOS has committed to support on going tasks from WP 2006. Nearly all 32 new tasks show potential for CEOS Contribution:

- As Contributing organization in:
 - Health: 3 new tasks
 - Energy : 3 new tasks
 - Agriculture: 3 new tasks
 - Biodiversity: 1 new task
 - User engagement: 1 new task
 - Architecture: 3 new tasks
 - Data management: 2 new tasks
 - Capacity building: New task
- As co-Lead in:
 - Climate: a postponed task from 2006 (Global Ocean Observing System)
 - Ecosystems: new task (Global Ecosystem Observation and Monitoring Network)
- As Lead and Point-of-contact in:
 - Water: 2 new tasks (Global Water Quality Monitoring & Satellite Water Quantity Measurements and Integration with *in situ* data)
 - Data management: 1 new task (Virtual Constellations)

Finally, CEOS Plenary was invited to discuss and endorse the overall positive appreciation of the GEO 2007-2009 Work Plan, to acknowledge the contribution already volunteered by a number of CEOS agencies in support of the Work Plan, and, to identify new volunteer agencies willing to contribute to new tasks of relevance to CEOS.

c) CEOS Response to GCOS Implementation Plan, including Actions for 2007

Barbara Ryan (USGS) referred to this issue.

As per a decision of the 10th Conference of the Parties (COP-10) of the UN Framework Convention on Climate Change (UNFCCC), Parties that support space agencies involved in global observations to request these agencies were invited to provide a coordinated response to the needs expressed in the GCOS (Global Climate Observing System) Implementation Plan. The response was expected to be presented at the 12th meeting of the SBSTA (Subsidiary Body for Science and Technical Assistance) during COP 12, in Narioby, Kenya, on November 2006.

A preliminary report was presented by CONAE in November 2005, in Montreal, at COP 11. For the preparation of the report CEOS-GCOS held a joint expert meeting (Geneva on January 9-11, 2006), where specific requirements re: Essential Climate Variables (ECV's) as observed from

space were outlined and formed the content of a “GCOS-IP Satellite Supplement” (V.0) released in late January and re-issued by GCOS in V.1 in March 2006.

The approach was approved at CEOS SIT 18 CEOS SIT-18 (Frascati, March 21-22), CEOS WGISS and WGCV were instructed to evaluate the tasks associated with GCOS-IP, and a Climate Task Team led by Barbara Ryan (USGS) was designated, and a second CEOS/GCOS Workshop was convened in Geneva on May 22-24.

Draft V.2 of the Satellite Supplement (GCOS-107) was released by GCOS Secretariat on August 17 incorporating changes from broad community review. This new plan includes:

- Reinforcement of GCOS Climate Monitoring Principles
 - Sampling, continuity, overlap, calibration, etc.
- Cross-cutting actions
 - Integrated products, reprocessing, reanalysis, archiving, etc.
- 28 Essential Climate Variables (ECVs)
 - Atmosphere: Surface wind speed and direction, upper air temperature, water vapour, cloud properties, precipitation, ERB, ozone, aerosols, CO₂, CH₄ and other GHGs
 - Ocean: Sea ice, sea level, SST, ocean colour, sea state, salinity
 - Land: lakes area, level and temperature, glaciers, ice caps and ice sheets, snow cover, albedo, land cover, fAPAR, LAI, biomass, fire disturbances, soil moisture
- Types of requirements
 - Reprocessing of past records, provision of archived data sets, requirements for future missions, cal/val issues

B. Ryan thanked all agencies that have participated and contributed to the preparation of the report.

The report **Satellite Observation of the Climate System The Committee on Earth Observation Satellites (CEOS) Response to the Global Climate Observing System (GCOS) Implementation Plan (IP)**, Developed by CEOS and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Body on Scientific and Technical Advice (SBSTA) on behalf of CEOS by the United States of America (USA) delegation is available on the CEOS and GCOS webpages.

It includes a look at the possibilities that appear by better coordinating current and future/planned capabilities, and also points out those improvements that will require additional resources or an extension of the current mandates of space agencies (e.g. the transition from research to operation status of missions).

GCOS has 10 Climate Monitoring Principles, which have been adopted by COP, WMO, and at CEOS 17th Plenary. However, currently, most mission responsables are not aware of their existence. This does not mean that they are not complied with, but that there is no mechanism in place to ensure such compliance.

The report lists a series of Actions by domain to be implemented and tracked by CEOS, leveraging the work to be done in the CEOS constellations.

As a way forward, CEOS agencies are encouraged to work in engaging their governing bodies to ensure the additional resources that will be needed to collectively meet the critical UNFCCC climate needs, the cooperation between CEOS and GCOS has proven fruitful and must be continued. CEOS will welcome feedback from the Parties on the report and is willing to report on systematic observations and progress to UNFCCC, if required.

Copies of the brochure “The Way Forward” will be distributed to Members and Associates, and they are invited to use the brochure and the full report as communications means to provide to their respective governments.

CEOS will have to track the actions, monitor progress and report results.

The closing remarks of the brochure:

“In conclusion, CEOS recognizes that both satellite and *in situ* data are required to better monitor, characterize, and predict changes in the Earth system. While *in situ* measurements will remain essential and largely measure what cannot be measured from satellites, Earth-observation satellites are the only realistic means to obtain the necessary global coverage, and with well-calibrated measurements will become the single most important contribution to global observations for climate.”

V. Liebig thanked B. Ryan for her leadership in this subject and invited GCOS to make a short comment. P. Mason also thanked B. Ryan and CEOS for the effort, and also highlighted the reaction of the Parties at COP-12, where countries strongly supported the use of satellite information. Also reported that SBSTA has given initial support to some changes in UNFCCC reporting guideline which includes the targets set in this implementation plan and SBSTA invited Parties to use new reporting guidelines in the reports due in September 2008. This is a very good opportunity for CEOS to have a continuous role every 4 years with the convention. It is an opportunity to highlight the need for additional support that is still needed and advocate for them before the Parties.

d) CEOS Constellation Concept, Process Paper and Prototypes

Stephen Briggs (SIT Team) talked about this.

The Constellation concept was first proposed during the discussion at 19th CEOS Plenary, and the first Paper of the Constellation Concept was presented at SIT-18, in Frascati, in March 2006, and strongly endorsed by Principals.

The concept attempts to provide agencies with tools for implementation of the elements that have been discussed previously (GEO WP, GCOS IP). This is a solid foundation from the community providing requirements.

Though agency spending will still be governed by national requirements, CEOS IP can seek synergies among the programs to fulfill GEOSS requirements, defining guidelines and standards to help agencies to determine from the outset what can be achieved. The constellations concept will allow the development of a commonalties approach among different agencies.

At the heart of the application of the Constellations concept is the definition of a series of standards (specific to each Constellation) – required to be satisfied for any mission to be included in the constellation – and a process of recognition/acceptance, whereby an agency applies to SIT to have one or more of its missions (ideally from the outset of planning) recognised as meeting the constellation standards and thereby satisfying the relevant user community needs

- Standards and recognition/acceptance process could be embedded within the activities of SIT using the kind of peer review system, of both space agencies and user groups, employed in the IGOS Partnership
- The “recognition” process is not an evaluation of the mission as such, but only its appropriateness within the context of the constellation

- Standards cover data access/data policy as well as technical issues
- Appropriateness of start date and operating period

The standards approach allows agencies of all sizes to plan a contribution of global value in their chosen domain. Minimum guidelines for maximum impact, and 'climate compliant' an obvious target – adherence to GCMPs and production of FCDRs

Progress in the development of the concept during 2006:

Jan-Mar 2006: CEOS IP TF developed the Constellation Concept Paper – drafted by S Ward & D Vidal-Madjar

Mar 2006: SIT-18 – Principals gave strong endorsement and encouragement for further development of the Concept

Apr-Aug 2006: Development of the CEOS Constellations Process Paper to guide the initiation, definition, and execution of each Constellation and Launch of 4 prototype Constellation studies to pioneer the way and to ensure some results on GEOSS space segment ahead of GEO-III Summit – Scoping Papers requested

Sep 2006: Draft Process Paper and Scoping Papers previewed and guidance given to Study leads

Oct 2006: Process Paper further developed and Study Teams asked for update for CEOS Plenary

The CEOS Constellations have been included as a task of the GEO WP 2007/9, with which CEOS is committed to comply.

4 Prototype constellations were developed:

- Land Surface Imaging
 - Lead: Bryan Bailey (USGS)
- Ocean Surface Topography
 - Lead: Stan Wilson (NOAA) & Francois Parisot (EUMETSAT)
- Atmospheric Composition
 - Lead: Ernie Hilsenrath (NASA)
- Precipitation
 - Lead: Riko Oki (JAXA) & Steve Neeck (NASA)

These scoping papers for the prototypes were discussed at SIT 19 in La Jolla (Sep 2006), and teams received guidance. Highlight outcomes of the meeting serve as guidelines for the teams:

- To frame the objectives, wherever possible, in terms of GEOSS IP long term objectives,
- To adopt a phased approach, focusing the initial efforts on a small number of achievable implementation goals
- To describe those goals in terms of the output (a product, service, FCDR, continuity) rather than the technology. Working backwards from a specification of the goal should clarify what effort is required
- The discussion recognised that these outputs might be on various time scales – some may be the short term wins CEOS needs, others may be related to climate data records and be long term – but all requiring better coordination of existing missions
- Continuity and intercomparability (as advocated by the GCOS Climate Monitoring Principles) were highlighted as obvious 'first order' objectives for the Constellations

S. Briggs then invited each Constellation Team Leader to make a short presentation:

1) Land Surface Imaging Constellation (Brian Bailey, USGS)

Outcomes sought for 2007:

1. An agreement, among CEOS agencies with current (and pending) moderate-resolution (eg 10-30m) land surface imaging systems, to more formally coordinate operation of those assets to function as a preliminary, *but real*, prototype land surface imaging constellation (including harmonization of data policies to enhance access to data, including historical data to benefit society and enhance scientific outcomes; coordination of ground systems and development of acquisition and data management strategies.
2. A suite of target characteristics (constellation standards) for moderate-resolution (10m-30m) land surface imaging systems that can guide international development of future moderate-resolution LSI systems to ensure continuity of high quality data.
3. An initial Climate Data Record (CDR)s a global forest resources assessment (FRA) to demonstrate the value of a constellation for moderate-resolution land surface imaging and to make a tangible contribution that both advances science and benefits society

Required agreements:

- Find a common ground in data policy.
- Agree on fundamental users requirements, that will drive the constellation standards. This entails making a requirements study for the constellation.
- Agreement on which Climate Data Record to pursue as an illustration of the benefits of the Constellation
- All agencies and organizations that currently participate in the operation of moderate-resolution LSI satellite systems, or who plan to launch such systems in the near future, would be invited and *strongly encouraged* to participate

Goals for GEO Summit – Nov 2007:

1. At least the framework of an agreement to have existing moderate resolution LSI missions working as a virtual constellation.
2. Definition of user requirements will be ready and a high level version of such requirements will be available for presentation
3. CDR progress will depend on which one is selected, but a description of such data and how it can be accessed, and the impact it will have, will be available.

2) Ocean Surface Topography Constellation (Jean Louis Fellous)

J-L.Fellous made a point indicating that Ocean altimetry has been a field that provided success story since the 1990s, which has achieved breakthroughs of ocean observation from space. Also, that it has had a strong component of international collaboration, involving European, US and other agencies' players. Data continuity has been excellent, since there have been several missions which fly already in a sort of virtual constellation. However, this continuity is in danger of being stopped in the coming years. This is why there are two kinds of outputs sought for this constellation:

1. Continuity of the climate quality data sets provided by Jason-derived climate data record beyond OSTM/Jason-2 (due for launch in 2008) – to enable global sea-level rise, as well as decadal and seasonal variability in sea-surface height (SSH) to be observed and related to droughts/floods and other extreme events, as well as used in seasonal forecasts
2. Continuity of geographical coverage by at least two complementary altimeters of the GFO and/or ENVISAT class – to enable the oceanic mesoscale variability in SSH to be observed and used for hurricane intensity predictions, oil-spill response, wave forecasting, and nesting of coastal models

Required points of agreement:

- For the first kind of output, Jason-derived climate record (per GCOS IP)
 - Approval by NOAA and EUMETSAT, with assistance from NASA and CNES, of a Jason-3 mission
 - Approval by NASA of an advanced wide-swath altimeter mission (that would incorporate a Jason capability)
- For the second kind, Observations of mesoscale variability (per GCOS IP)
 - Agreement by ESA to operate CryoSat-2 altimeter over ocean (currently this is to be operated over ice caps, but it can be operated over the oceans).
 - Approval of Sentinel-3 by ESA
 - Identification by CNES of a flight opportunity for AltiKa
 - Agreement by State Oceanic Administration of China to provide timely access to altimeter data from HY-2A (due for launch in 2009)

Goals for GEO Summit - Nov 2007:

- Approval of Jason-3, wide-swath altimeter, and Sentinel-3 missions
 - o Initiation of Phase A Study for Jason-3
 - o Initiation of Phase A for an advanced wide-swath
- Identification of a flight opportunity for AltiKa
 - o Sign agreement for flight of AltiKa.
- Agreement by SOA for timely access to HY-2A data
 - o Sign agreement for timely access

Also, GCOS has requested that this constellation be not limited to Ocean surface topography, but it included, lake/reservoir/river water levels and ice sheet/glacier topography

3) Atmospheric Composition Constellation (DeWayne Cecil on behalf of Ernie Hilsenrath)

As in the case of Ocean Topography, very useful measurements have been already made, but their continuity is also in danger.

Expected outputs, for example, continuity of global ozone amounts needed to assess the effects of the Montreal Protocol and impact of climate change

Anticipated space assets:

- Continuity and calibration of NASA Aura/OMI, NOAA/SBUV-2, and METOP/GOME-2 ozone observations through at least 2020
- NPOESS/OMPS including ozone profiler component (recently de-manifested from NPOESS series).
- Reconciliation of expected residual biases in derived ozone data sets
- Ozone instruments on-board Chinese FY-3 could be included with implementation of proper cal/val efforts

Additional assets to fulfill requirements:

- After Aura and Envisat (~2010), there will be no observations of chemical active atmospheric constituents in the stratosphere. Without these it may be impossible to interpret chemical process responsible for trends and to assess the effectiveness of the Montreal protocol.
- A limb/occultation sounder (like Aura, Envisat, SAGE or ACE) essential for global coverage and baselining atmospheric composition stratospheric profiles
- The Constellation will consider both research (Envisat, Aura, and SciSat) and operational (Metop, NPOESS, FY-3) satellites to fulfill GCOS and IGOS/IGACO requirements.

Required points of agreement:

- Utilization of common spectroscopic parameters
- Consistency of radiative transfer models for algorithm implementation
- Commitment to long term cal/val program for data accuracy (bias reconciliation) and long term precision suitable for trend analysis
- Continuing support for science teams and free exchange of data

Goals for Nov 2007 GEO Summit:

- Agreement of relevant agencies to participate and support Atmospheric Composition Constellation Study efforts. This is essential otherwise the Constellation concepts will not survive.
- Commitment by the agencies to support the four "Necessary Agreements" listed above
- Commitment to fly OMPS Limb Sounding instrument, which was de-manifested from NPOESS is essential (CEOS Response to GCOS IP Action Item A-8)
- Initiate discussions of flying a stratospheric composition limb or occultation sounder such as MLS, MIPAS, SAGE, or ACE. This mission is needed to continue benchmark measurements of active chemical species in the stratosphere.

4) Precipitation Constellation (Chu Ishida, on behalf of Toshio Koike)

Outputs:

- Continued operations of the Tropical Rainfall Measuring Mission (TRMM)
- Continued development of the GPM mission as the pathway to implementing the CEOS Precipitation Constellation to serve the GEOSS user community.
- Definition of the series standards from the Precipitation Constellation scoping paper

Required points of agreement:

- Approval of TRMM mission extension
- Implementation of further GPM partnership agreements
- Agreement on the series standards
 - Scientific requirements for the measurements: spatial, spectral and radiometric performance of passive microwave instruments and radars => guidance regarding minimum requirements for sensor specifications for inclusion in the CEOS Precipitation Constellation;
 - Technical specs for inter-calibration (with other spacecraft in the constellation and with ground systems) and definition of common calibration practices;
 - Technical specs for the data format and inter-operability of the data acquisition and distribution networks;
 - Agreement on general principles of data policy for required data exchange

Goals for Nov 2007 GEO Summit:

- Approval of continued TRMM operations
- Completion of GPM instrument (DPR, GMI) preliminary designs
- Increased coordination among interested agencies
- Increased coordination between international precipitation science teams

S. Briggs thanked the Constellation representatives for their presentation, and indicated that the draft was circulated ahead of plenary for comments and SIT will welcome CEOS Members comments during the meeting and that the development of the concept will continue in the Task Force.

As way forward for 2007, the 4 Prototype Constellations will continue to be developed in parallel to the definition of the Constellation Concept for definition of future constellations.

SIT will designate a high level liaison with each of the constellation teams, and would also like to have similar links with the GEO Secretariat in order to monitor and ensure each constellation fulfils the criteria for a suitable proposal.

Prototype constellation proposals will be approved by SIT in January 2007. September 2007 is target date for the presentation of studies, which will be due for report in SIT 20 (July/Sep 2007). Significant resources from agencies will be needed to support these studies.

S. Briggs ended his presentation by reminding the Plenary that this task was proposed and offered to GEO by CEOS, and it is CEOS responsibility to fulfil it and provide the resources required.

V. Liebzig thanked S. Briggs and the Constellation leaders for their presentations, and invited Plenary to provide comments on this subject.

J. Achache (GEO Sec) thanked CEOS SIT for the intensive work and the advance made in the definition of the constellations. As comment, he pointed out that GEO's basic principles are the balance between SBA's and between space and in situ observations, the coordination of activities and a transverse dimension, and that these three elements should be taken into account when working with the constellations. With respect to LSI Constellation, he referred to the bullet mentioning forest monitoring, which appears to be out of context within the constellation and doubling an existing task of GEO, already under development, so he invited CEOS to participate in the corresponding GEO task.

He also noted that CEOS is working to respond to GCOS IP, but this should not mean that it is only centred in Climate, because for GEO, Climate is only one of 9 SBA's, and this would limit CEOS view and have other SBA's feel left aside.

Finally, he agreed on the need for liaisons between GEOSec and Constellation Teams. He proposed that the role be filled by Michael Räst, who would deal with all 4 constellations.

S. Briggs thanked J. Achache and clarified that constellation are cross-cutting by definition. GEO is defined in SBA's, but constellations are defined by physical measurements, which are also cross-cutting. With respect to the Climate issue, the intention was to have a definition of the benefits of the constellations in the short term. With respect to GCOS, it gives the advantage of being the most extensively defined so far.

V. Ryabinin made reference to the International Polar Year (IPY), that will start in March 2007. IGOS Chryosphere Team developed concept of global interagency IPY polar snapshot so that observations (space and in situ) will be collected and analysed during the next two years to produce a unique data set for study of polar regions. He expressed interest in establishing links with the constellations teams.

V. Jha (CSA) congratulated the teams of the constellations for the progress made. He also indicated that success will lie on achievement of agreements regarding data sharing. Since the target timeframe is end of 2007 this gives the impression of lack of progress, so he proposes to shorten the terms.

G. Camara (INPE) also thanked and commended the work of the teams. He repeated the commitment of Brazil to GPM and informed that from May 2006 all CBERS and Landsat archive data has been made available for free in Latin America and China has released their CBERS archive. They have discovered by this experience that data format problems disappear if the data is release in .tif and that calibration problems should not be overestimated. Finally, he made a request to SIT, there should be provisos in the plan when it is presented to GEO, mainly, that some specifications cannot be fulfilled because of export licensing restrictions. Accessibility to key components is fundamental to comply with standards. This is a crucial issue.

P. Mason (GCOS) gave a perspective of the user. He pointed out the need for the cooperation in data access. GCOS and Climate community would be upset if constellations included missions whose data is not accessible outside the owner country. He highlighted that observations will be of use to several SBA's, with some few exceptions.

Before breaking for lunch, V. Liebig made a short summary of the way forward for 2007 regarding these activities:

- Continue the development of the CEOS IP document and contents (Convert Climate Chapter actions into a plan format, Define actions required to achieve long-term space segment targets for other SBAs – in consultation with GEO SEC, CEOS IP Task Force will continue to assist in order to share the workload, to have the first full version ahead of CEOS-21 (some SBAs may remain unpopulated))
- Progress for the 4 prototype Constellation studies (Appoint SIT Liaisons to Constellation teams, Dec 2006 is the deadline for meeting Process Paper criteria for a Constellations Proposal, Sep 2007 is the deadline for Constellation Study Reports so as to have results available for GEO Summit in Nov 2007 in South Africa)
- Focus on planning a demonstration of space agency resolve and results at the GEO Ministerial Summit planned for late 2007 (South Africa)

He thanked all agencies for their support in 2006. During 2007, there will be only one SIT meeting (June, in Frascati), in order to reduce the pressure of multiple meetings.

e) Role for commercial sector

Paula Freedman (BNSC) talked about the paper developed during 2006 regarding the relationship of CEOS with the commercial sector. The paper was distributed with Plenary documentation, and was prepared by an independent contractor.

This issue has been object of study several times by CEOS in the past. The relationship was included in the 5-Year plan, and it is worth taking a new look at it to see how it develops, even though no immediate decision is required.

The study has considered the views of the players such as CEOS and Geo, and also has included the view of industry. It looks at potential changes to increase participation of commercial sector in CEOS, including change in membership (create new category "Commercial"), establishment of new Task Forces, create new separate fora for coordination.

The study looked at the panorama presented by GEO, the CEOS constellations concept and the growing role of the commercial sector in the EO community. It identifies three challenge areas presented by GEOSS (Data Access, Innovative Solutions, Mission Specification) and the possibilities /advantages of commercial participation for each of them. It also considered the development of the constellations and possible areas of interaction with the commercial sector.

It concludes that there is a rapid evolution of the world of EO and that CEOS needs to evolve accordingly. That greater involvement of the commercial sector should be a priority since it is an essential partner for GEO. According to the initial survey made by the contractor, there is willingness in the commercial sector to be involved in the activities of CEOS on the basis of a mutual benefit relationship. The study suggests that there should be a transitional process to define this relationship, taking as basis for a way forward the three challenges posed by GEOSS:

- Data access - Science use of commercial data
- Innovative solutions – Industrial innovation and market opportunities
- Mission coordination - best practice through industry involvement

It also suggests the establishment of Task Forces (or other mechanisms) to explore these options and report within the year

P. Freedman finished the presentation requesting the Plenary for their initial reaction to the study and the proposed way forward.

Roy Gibson pointed out that this issue is to be dealt with in the development of the Implementation Plan by the Task Force, and so it does not require the Plenary to take any action at this point. P. Freedman agreed on this point of view, but anyway invited participants to give an idea of their initial reaction to the report.

Gilberto Camara (INPE) seconded R. Gibson's position that it is too early to start a discussion on this issue in Plenary. Further preparation and study are required, including the issue of how the commercial sector will use the data provided by agencies to enhance social benefits..

Greg Withee (NOAA) mentioned that NOAA has the role of licensing commercial data providers in the US. He suggested to take a slow pace. There is growth in commercial data providers, as well as technology providers that in fact influence the constellations. He recommended the task force to take these two factors into account and look for innovative ideas for CEOS to be able to take advantage of what the commercial sector can offer.

Virendra Jha (CSA) coincided with the previous speakers and added in relation to constellations, that the task force should look at what is available commercially to meet CEOS needs.

V. Liebig summed up the discussion by saying that CEOS should look at this issue through the Task Force and the constellation teams, and looking at other examples, such as the Charter, that have successfully got access to commercial data.

f) Long-term targets for the GEOSS Space Segment

Chu Ishida (JAXA) presented his study performed in response to Action IP-TF 1-6: *to contribute a short analysis of the GEOSS long-term targets as foundation of the CEOS Constellation implementation.*

The study was intended to provide an overview of CEOS related targets identifying GEOSS IP "high level" requirements and to recommend CEOS "high level" actions to respond to the requirements, accordingly. This provides a roadmap for a new CEOS process for mission coordination. The preliminary study was presented at SIT-18 in March, in Frascati and in May a revised version including GEOSec comments was presented.

Targets are categorized as; Space-based observation, In-situ observation, Integration, Products, Models and Strategy.

An example based on the Water SBA was shown, and a chart indicating the different targets identified and the commonalities among different SBA's.

As a conclusion, the study shows that

- there are clear user requirements for the following missions, indicating a need for CEOS to coordinate these as priority mission.
 - SAR constellation (L-band, C-band and X-band)
 - GPM, particularly its microwave radiometer satellite constellation
 - Continuation of moderate-to high resolution satellites
 - New instruments for ECVs

- Global ecosystem mapping and land cover missions
- CEOS should address implementation of the following fast-track requirements;
 - DEM, particularly availability of SRTM 30m
 - Strengthening the International Charter Space and Major Disaster
 - GeoNETCAST
- CEOS should work with relevant in-situ organizations to address the following integration requirements;
 - Integration of InSAR and GPS for warning and prediction systems
 - Integrated water cycle observation and data system
 - IGOS Carbon observation system and global nitrogen observation system
 - Integrated observing system for atmospheric composition
 - Integrated observation system for on-time drought warning system and on-time monitoring system for land degradation and desertification
- CEOS should address generation of data and products of high priority;
 - Global products of ECVs
 - Common metadata, data and products among SBAs
 - Global ecosystem mapping products
 - Global land cover and land cover change products
- CEOS institutional framework can address issues;
 - SIT to address commitment of CEOS space agency for coordination process and resources
 - WGs to address standard and interoperability guidance, and capacity building, etc

“High level” actions are recommended for CEOS to address the continuity and new development of CEOS missions are required. This is closely connected with ongoing “CEOS constellations” discussion; to work with relevant in-situ organizations to address integration requirements. Integration challenges can be made through the IGOS process; product issues will be able to follow the case of “Climate”. Role of CEOS Agencies and task sharing among related entities need to be clarified for generation of products of other SBAs; CEOS needs to actively participate in activities of consolidation of user requirements, particularly “Health” and “Energy” SBAs.

The following next steps are proposed:

1. The CEOS Implementation Plan Task Force should work to refine and conclude the high-level description of the GEOSS space segment – so that all space agencies share a common understanding of the strategic directions required for their individual and coordinated efforts.
2. CEOS should convert the high-level description of the GEOSS Space Segment into an action-based implementation plan for each of the GEOSS SBAs and cross-cutting domains. This should be achievable in time for the 21st CEOS Plenary in 2007.
3. Space agencies need to address the major issue of space agency commitment and resource for the co-ordination process (through CEOS).
4. CEOS WGISS and WGCV should play a leading role in 2007 in a study focused on the generation of ‘CEOS global products’ in support of the GEOSS requirements.

V. Liebig highlighted the importance of looking for long term targets, this is essential for all agencies in the elaboration of their plans and invited the reaction of the Plenary.

R. Gibson pointed out the importance of making the analysis available to GEO to ensure that CEOS is taking the appropriate look at the issue.

P. Mason (GCOS) was appalled by the amount of work required and asked who would be in charge of realizing it.

C. Ishida clarified that this study does not mean that these actions are the sole responsibility of CEOS, but it gives a perspective on the way to take.

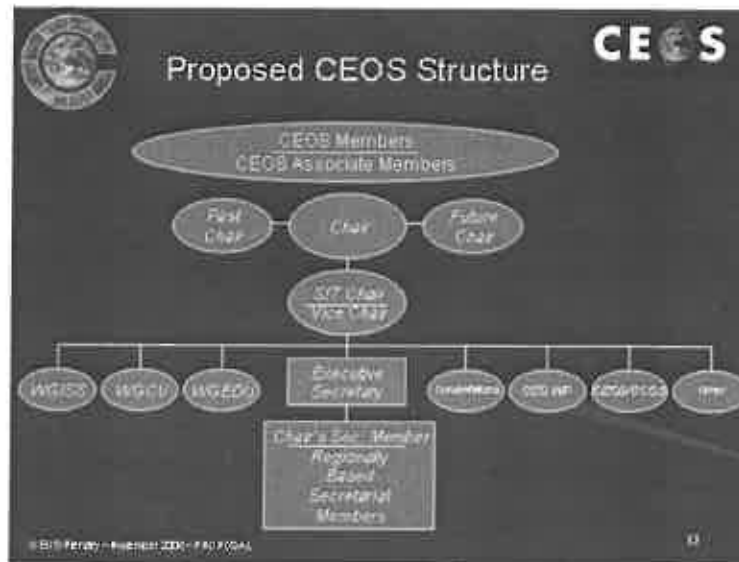
V. Liebig thanked C. Ishida for the presentation and concluded item 6 of the agenda.

7. Strategy Discussion

a) Transitioning to Action

Barbara Ryan (USGS), incoming Chair, presented a proposal for strengthening commitment to existing programs and structures of CEOS. Starting from the current structure, three different instances are identified:

- **Strategy:** comprising the Troika of Past, Current and Future Chairs, the SIT and the new figure of the Executive Secretary (in charge of coordinating the CEOS Secretariat)
- **Implementation:** comprising Working Groups and Ad Hoc Teams, coordinated by Executive Secretary, they are in charge of completing the tasks defined by the Strategy Group
- **Administration:** The CEOS Secretariat, with regional representation, and the duty of carrying on the activities of CEOS during the year, the Executive Secretary will be leading its activities, also ensuring an appropriate liaison with GEOSec.



NASA volunteered to nominate DeWayne Cecil as liaison for the coordination with Working Groups. The offer was gladly accepted.

Plenary thanked incoming CEOS Chair, Barbara Ryan, for her work on the CEOS structure, and accepted her recommendations.

Plenary also agreed the initial terms of reference for the CEOS Executive Secretary as described in Annex III and accepted with thanks the ESA offer to provide a suitable person for the position during the coming 2 years.

CEOS Chair will report annually to Plenary on the progress being made in this domain.

b) CEOS relationship with IGOS-p

Dr. Liebig reported the discussions during IGOS-P 13 bis, which took place the day before the CEOS Plenary, regarding the possible ways forward of IGOS in the GEO era. IGOS had a fruitful brainstorming and decided that integration with GEO should be gradual, and that a plan should be prepared for such integration, considering GEO issues, IGOS Themes, theme reports and recommendations, and Constellation concept as an implementation tool for GEO tasks

To this end, a small team will be nominated, including participation from Partners, Theme Leader's and GEO Sec, to consider the process and to develop options for a transition. The group will present its report to IGOS Partners 1 month ahead of IGOS-P 14 (May 2007).

c) 2007 Calendar

Barbara Ryan presented the general schedule of meetings for 2007:

CEOS Plenary

21st CEOS Plenary	13-14 Nov 2007	Hawaii, USA (USGS host)
22nd CEOS Plenary	11-12 Nov 2008	South Africa. Venue TBD

CEOS Strategic Implementation Team (SIT)

SIT-20	19-20 June 2007	Frascati, Italy
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Might have meeting(s) of opportunity of CEOS Principals who attend major international remote conferences at strategic times during 2007, such as ISRSE, Costa Rica, 25-29 June 2007

CEOS Working Groups

WGCV-27	12-14 June 2007	London
GEO/CEOS WGCV Workshop	2-4 October 2007	Geneva
WGISS-23	21-25 May 2007	Hanoi, Viet Nam (Vietnam Remote Sensing Center host/JAXA sponsor)
WGISS-24	15-19 October 2007	Germany (DLR host)
WGEdu-8	April 2007	Frascati, Italy
Jay Feuquay Memorial Workshop	Hawaii, USA	in conjunction with 21st Plenary

IGOS-P

IGOS-P 14	30 May 2007	Paris, France
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GEO

GEO-IV and Ministerial (EOS-IV)	28-30 Nov 2007	South Africa (GEOSS Implementation Two-Year Review)
Jay Feuquay Memorial Workshop	Capetown South Africa	In conjunction with GEO IV

8. GEO Update

José Achache talked on behalf of GEOSec. Mainly, GEO Membership has increased to 66 Member countries, and there are 15 more potential members. GEO has created rules for accepting new Participating Organizations.

There has been significant progress in the Work Plan, as reported by J-L Fellous previously. GEO is growing and observation systems are being implemented taking GEO/GEOSS in mind.

GEO is not a funding agency, but a coordination mechanism, which can help channel support for activities.

The GEO Secretariat is working with several seconded staff.

Elements for the Architecture of GEOSS are to be ready by the end of the year, enabling the GEOSS to start its implementation. GEO Portal, registries, etc.

Calibration and Validation, GEO quality assurance strategy has been defined.

One point to highlight is that it is difficult to work evenly with all communities that comprise GEO, since there are different levels of advance and understanding of the use of Earth observation. In this sense, activities of outreach have been organized with these new communities so as to help them to have a closer understanding of the GEOSS.

A capacity building Strategy, worked out with CEOS WGEdU, has been defined for approval at next GEO Plenary, in Bonn, as well as an outreach plan. During GEO IV in Bonn, there will be a press conference on GEONetcast.

The work of User Interface Committee and the Communities of Practice is beginning, and needs clarification of roles. Therefore, IGOS proposal is very relevant and useful.

Process for contributing components to GEOSS has to be defined and adopted for adding proposed components.

Data sharing principles of GEO will be a critical issue in the near future for discussion by GEO members.

GEO IV will take place in Bonn, Germany on November 28-29; all material has already been distributed to participants.

9. CEOS related radio frequency issues

9.1 BNSC Report

Mark Churchyard (BNSC) presented the conclusions of the Survey realized during 2006 with respect to the use of space frequencies for earth observations. The report was printed and distributed to all participants.

Response from Members to the survey has not been as extensive as expected, so Members are encouraged to send their inputs in the future. Main conclusions are:

- Telecommunications and ultra wide band systems are emerging as the principle threats to Earth observation frequency use.
- Passive bands are under the most immediate threat from interference.
- There is some awareness of the threat to spectrum use: those directly involved in frequency management issues showed a clear understanding of the issues, whilst the response from many others was restricted to their own use and did not address threats.
- Critical threats are emerging: the threat posed by UWB operations at 24GHz for example was seen as particularly critical as this band is important for operational meteorology.

Recommendations arising from the survey:

It is recommended that the Earth observation community undertake further studies into the impacts of losing dedicated frequency bands. It is clear that there are a number of threats to key sensing frequencies: more, quantitative, information on impacts across a range of applications would help to strengthen the case for the maintenance of protection for these bands.

It is recommended that the EO community shares the results of studies into the impacts of frequency losses with other interested parties. This would further strengthen the case for the maintenance of protection for these bands.

It is recommended that the national and international bodies with an interest in the protection of frequencies for Earth observation applications should coordinate their lobbying of organisations responsible for frequency allocation.

It is recommended that CEOS works to ensure that the whole Earth observation community is fully aware of the threat posed by RF interference.

It is recommended that priority is given to protecting the key areas of the spectrum that have been identified.

The proposal for a way forward is:

- CEOS provides a focussed body from which it can coordinate and inform the international Earth Observation community
- It is important that CEOS maintains an active role in identifying threats to the EO community
- This topic should remain a permanent item on the CEOS agenda for each Plenary
- It is important to receive feed back from the WRCs and to understand the topics and threats for future WRCs in order to prepare suitable defences.

It was agreed that BNSC will update the report yearly, and members were invited to send the news and activities of their agencies to keep the information up to date.

Chair Varotto thanked BNSC for the outstanding work, and made emphasis on the relevance of this issue, and the importance of dealing with it while working in the constellations concept.

EUMETSAT also congratulated BNSC and indicated that Coordination Group of Meteorological Satellites (CGMS) has a frequency coordination group that is working since long time on this issue, with regard to meteorological satellites. He highlighted the importance of a continuing work with ITU to have a relevant influence on this issue.

JAXA congratulated and thanked BNSC for the report, and drew attention of the Plenary to the issue of frequency of 6-7 Ghz used by passive microwave for soil moisture, sea surface temperature and sea surface winds which is suffering increasing interference.

9.2 Space Frequency Coordination Group Report

Edoardo Marelli (SFCG) reported on the activities of the Group:

SFCG-26 was held in Germany, in September 2006. The meeting was attended by 59 delegates from 13 Space Agencies and 2 Observer Agencies, and at the meeting the document SFCG Objectives for World Radiocommunications Conference 2007 (WRC07) was finalized, stating the group's position for each agenda item of WRC07).

The group appreciated CEOS interest in establishing an active cooperation in this aspect, and a preliminary version of the SF Survey prepared by BNSC was circulated among its members for their information.

SFCG-27 will take place in September 2007 in Spain. There will be a Conference Preparatory Meeting (CPM) will take place for two weeks in February 2007, to finalize the report on the results of the technical studies related to WRC-07. The WRC-07 Conference will take place from mid-October to mid-November 2007.

The main WRC-07 Agenda Items of concern for EO are:

- ✓ 1.20. Regulatory measures to limit unwanted emissions in bands used by EO passive sensors (1.4, 24, 31 and 50 GHz). Essential for the future of atmospheric RF vertical sounding (last 3 bands). Important for future salinity/soil moisture measurements by radiometers (1.4 GHz).
 - ❖ **Only explicit regulatory limits in the ITU Regulations (UN International Treaty) will protect these bands . Generic Recommendations will not really help.**
- ✓ 1.2 Identify sharing criteria in the bands 10.6 and 36 GHz. These bands are used by EO passive sensors (radiometers). The agreement on sharing criteria with terrestrial fixed and mobile links appears to be difficult in the 10.6 GHz band. Agenda Item 1.2 includes also the extension from 200 to 300 MHz of the allocation to Meteorological satellites downlinks around 18 GHz.
 - ❖ **This will be necessary to cover the high rate downlink requirements of future geostationary Meteorological satellites.**
- ✓ 1.3 Extension of the 9 GHz active sensors allocation from 300 MHz to 500 MHz. Required for high-resolution SAR imaging (~1 meter)

- ✓ 1.12 Modifications of the ITU filing regulations to allow a proper registration of the satellite active and passive RF sensors. Currently the mechanisms are suitable to register satellite data communication links only.

He also pointed out some other issues of interest to CEOS which are not part of the WRC Agenda:

- Need to prevent overcrowding of the 8025-8400 MHz for EO data downlink. A new Recommendation has been finalized in ITU. It establishes new rules on the use of the 8025-8400 MHz for EO data downlink. It is based on a similar SFCG Recommendation that was finalized at SFCG-25 and then brought to ITU. The objective is to introduce some discipline in the use of the band in order to mitigate the effects of the expected overcrowding of this band in the next years. Agencies are encouraged to follow this recommendation when planning missions that use this band and exert some self-limitation in order to avoid mutual interference.
- Studies are on-going in SFCG about how to best share between EO and space science missions the 25.5-27 GHz band for very high-rate downlink. Future lunar exploration missions, Lagrangian points missions and large EO missions are likely to use this band in the future.
- In addition to the famous car radars at 24 GHz, many new Short Range Devices (SRD) are proposed at many frequencies. Continuous surveillance of these proposals is needed by everybody. SRD's are typically unlicensed devices, i.e. their number and location is not controllable by anybody, once they are authorized by a telecom authority.

With respect to the cooperation between SFCG and CEOS, there is very much interest in the lobbying activities by CEOS members with their respective national delegations for the WRC07. Specially, in those countries in which the national delegations have produced preliminary positions for the Conference that are not consistent with the objectives proposed by SFCG. Increased awareness by regulators of the impact of the importance of the EO services and the impact of RF interference.

Also, there is much interest in receiving further inputs from CEOS in the generation of documents regarding identification of long-term needs (as presented by BNSC previously) and providing ammunitions for the protection of RF.

Chair Varotto thanked E. Marelli for his presentation and highlighted the importance of his presence in the CEOS meeting and the interaction with CEOS agencies, and proposed that every CEOS Plenary included an item in which agencies report their activities with respect to RF during the year.

9.3 Approval of proposed CEOS resolution concerning World Radiocommunications Conference 2007 (WRC 07)

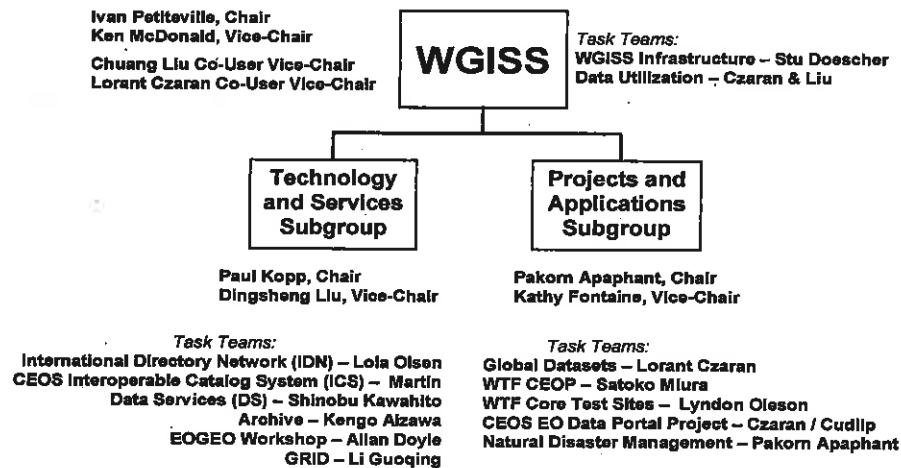
After replacing the Annex to the draft of the resolution with the latest version of the document SFCG Objectives for WRC 07, the Resolution was adopted by the Plenary. (Annex IV).

10. Working Groups Reports and Actions

10.1 WGISS

Ivan Pettiteville presented an update of WGISS activities during 2006 and an update on the structure and leadership changes in the group. The slide below shows the current structure, taking into account the changes occurred since last Plenary.

Structure & Leadership Changes



WGISS 21 was held jointly with WGCV in Budapest, Hungary, on May 8-12, hosted by EOGEO Hungary & HUNAGI (Hungarian Association for GEO Information) and WGISS 22 was hosted by NASA in Annapolis, MD, USA, on September 2006. In 2007. Both meetings had representatives from GEO and worked on contribution to GEO WP and the CEOWS Implementation Plan. The next two meetings will be held in Vietnam (May) and in Germany (October) hosted by VRSC (Vietnam Remote Sensing Center)&JAXA and DLR respectively.

Summary of the activities of the WGISS SubGroups and Task Teams in 2006:

1) Technology and Services Sub Group

- International Directory Network (IDN) Task Team:
 - Extensions Provided to Account for Data Models, 16,000 Metadata Records as of August 2005, 1,500 Service Entry Resource Format (SERFs), Descriptions of Commercial & Non-Commercial Earth Science Tools, Resources, and Services (Links to Downloadable Software, Models, and Tools)
 - Between WGISS-20 and WGISS-22 : the number of Unique Hosts averaged 40,345, and the number of total hits was over 4.6 million
- Interoperable Catalogue System task Team:
 - ESA has Developed an XML to CIP Gateway: *eoPortal*, it provides Catalog Access to: ESA, DLR, NASA, and KARI
 - The EO Portal is the basis for the future GEOPortal, that will be presented in Bonn, in November.
- Data Services Task Team:
 - It has a mandate for exploring new technologies, current technologies being explored: Data Server, Process Server , Catalogue to Publish and Find Systems, Dynamic Service Systems Chaining, Semantics to Select and Bind Systems.

- Past and ongoing work includes: Service Catalogues, Bind Distributed Diverse Systems (some are available to non-WGISS Users), Application Oriented Development (e.g. Air Quality, Agricultural Monitoring)

➤ EOGEO Workshop

With respect to this annual workshop organized by WGISS for developers, the Group proposes to broaden and reorient it towards a CEOS-level conference to address all issues related to space contribution to GEO (large participation of end-users, scientists, politics, commercial sector,...)

- WGISS has also started work on the generation of a CEOS Interoperability Handbook with the purpose of providing recommendations for the development of interoperable systems (i.e. implementing interoperable services) in response to the high level requirements expressed under the *CEOS Resolution and Principles drawn on WGISS 10 year experience*. And for immediate use by anyone willing to implement interoperable services in a way that preserves their interoperability: CEOS agencies, GEO, etc.
- The Handbook would include:
 - Analysis of the interoperability concept
 - Description of interoperable systems according to several views (data preservation, data access, from data to information, infrastructures enabling interoperability)
 - Related Recommendations

2) Project and Applications Sub Group

- EO Data Portal Project Task Team:
 - Coordinate Global & Local Dataset Access
 - Began Landsat Data Transfer (USGS, UN, BNSC)
 - Developed Demonstration Client
 - Integrated CEOS European Data Server (ICEDS)
 - Created Guidelines Document
 - Begun to Talk to Users in Africa
 - SRTM Incorporated
- WTF Core Test Sites:
 - ESA and the USGS have developed a plan to transition the WTF Core Test Sites capabilities into the EO Cal/Val Portal.
 - Preliminary Cal/Val Portal technical plans include:
 - A software extension to access USGS servers
 - WTF core sites integration into the Cal/Val Portal site database
 - Definition of a minimal common set of meta data (Cal/Val and WTF) including quick-look and thumbnails, and storage of meta data locally at Cal/Val Portal
 - WTF transfer is targeted to be completed in Autumn 2007
 - USGS will continue to support access to the existing Core Test Sites WTF in the interim
- WGISS also works closely with Coordinated Enhanced Observing Period (CEOP) in the WTF/CEOP Task Team
 - (1) Two Prototyping Activities :
 - Continued Development of a Distributed Integration Service for Water Cycle Science

- JAXA Prototype
- NASA Prototype
- (2) CEOP data for 35 reference sites
 - In-situ Data
 - Time Series and Gridded Model Output Data
 - EO Satellite Data From JAXA, NASA, ESA and EUMETSAT
- (3) WTF for Core Test Sites Contribution
- (4) CEOP Phase II Approved

With respect to outreach activities, WGISS was very active during the year, attending both technological and user-oriented conferences and meetings. Also, it worked on the WGISS Brochure, the CEOS Interoperability Handbook and published articles on the activities of the group.

Regarding the activities on Data Utilization, started from 17th Plenary, WGISS has worked on this with the Data Utilization Task Team, which produced a set of recommendations for action, that are ongoing now. A detail of the actions is included in the WGISS Report document, distributed with the 20th Plenary documents.

Upon a request by SIT, WGISS has provided support in the review of the GEO Work Plans (2006 and 2007/9), in the CEOS response to GCOS IP, in the development of the CEOS Constellations Concept, and in the activities of the Task Force for the elaboration of the CEOS Implementation Plan for GEOSS.

WGISS members are also participating in GEO Task Teams, WGISS Chair, I. Petiteville is Co-Chair of GEO Architecture & Data Committee, acting as CEOS Rep.

As for the contribution to the GEO WP, WGISS has identified 14 tasks for potential contribution from the Group, which will require additional resources and support from the CEOS agencies.

WGISS is also currently working on a update of its 5 Year Plan (last version in 2004), in order to allow WGISS to better support the CEOS IP and in particular the GEO-related activities including GCOS and CEOS Constellations. This would entail redefining WGISS Objectives and revising the Implementation Process.

Main changes proposed:

- Achieve a closer coordination with SIT via WGISS Chair, by regularly reporting to SIT, receiving information from SIT, participating in SIT meetings and telecons, having SIT representatives invited to WGISS meetings, and reviewing SIT documents
- WGISS Vice-Chair to be in charge of Overall Coordination of GEO-related activities within WGISS (specific new duty)
- Current WGISS activities and expertise proposed to GEO Task Teams as WGISS Contribution whenever relevant
- Nominations of WGISS Points of contact to interface with the relevant GEO Task Teams.
- Future WGISS activities should be justified by a GEO need

Agencies are encouraged to endorse the update of the WGISS 5-year Plan.

New WGISS Vice-Chair: Agencies are invited to nominate candidates for this position by January 15, 2007. Candidates should have some experience with WGISS, be willing to serve for four years (2 as Vice-Chair starting in November 2007, and 2 as Chair) provide Secretariat as Chair, and be ready to dedicate extra time.

Finally, the WGISS Chair reminded Members of the recommendations made by both the IP TF (see CTF-8 & CTF-10) and the SIT, encourage the ...

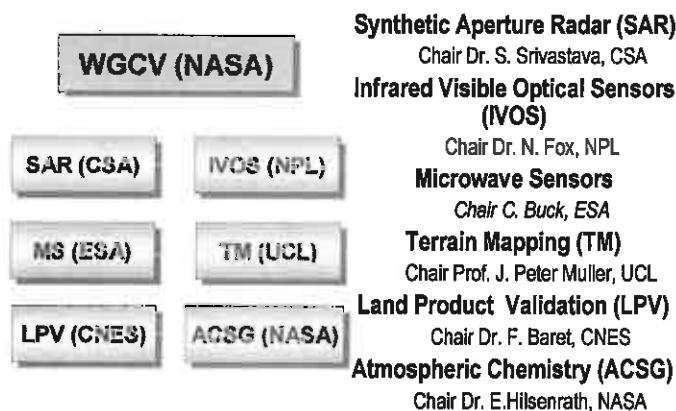
“CEOS Principals [...] to review their agency’s membership to CEOS Working Groups in order to provide them with the necessary expertise and resources to accomplish their work.”

J. Achache (GEO Sec Director) thanked WGISS for their major contributions in the Architecture and Data area. This has been a significant contribution by CEOS to GEO. He also made reference to the upcoming task for Sensor Web (for in situ observations), WGISS was encourage to work with the Sensor Web for the merging of space and in situ data. The recommendation was thanked by WGISS chair, indicating that the group is already aware of this task.

10.2 WGCV

WGCV Chair, Stephen Ungar (NASA) made a presentation of the current situation of the Group. The following chart shows current structure.

CEOS WGCV Subgroups



WGCV chair informed that the Group held two meetings, WGCV-25, in Budapest Hungary, on May 9-12, jointly with WGISS, and WGCV-26, in Chiang-Mai, Thailand, on October 31-November 03, hosted by GISTDA, and preceded by an IVOS Meeting on Oct 30.

The objectives of WGCV-26 were to select candidates to continue the leadership of the group, to clarify the group’s role with respect to GEO tasks, and to prepare recommendations for the 20th Plenary of CEOS.

He presented the candidates selected at the meeting and requested the Plenary to endorse their selection so as to make their designation effective as from the 20th Plenary. Candidates are:

- Chair November 2006-November 2008
 - Dr. Changyong Cao (NOAA/NESDIS)
- Vice Chair November 2006-November 2008
 - Chair November 2008-November 2010
 - Pascal Lecomte (ESA/ESRIN)

The Plenary accepted and endorsed Changyong Cao and Pascal Lecomte as Chair and Vice-Chair respectively.

Also, the Chair of Atmospheric Composition SubGroup (ACSG), Dr. Hilsenrath, will step out of the Chair and is looking for a replacement in the next few months, though he will continue his active participation in the CEOS constellation for Atmospheric Composition.

S. Ungar then continued presenting the 18 GEO tasks in which WGCV is currently leading, contributing or participating on behalf of CEOS.

Main interest for the scope of WGCV is DA-06-02: **Develop GEO data quality assurance strategy, beginning with space-based observations and evaluating expansion to *in-situ* observations**, in which WGCV has a Leading Role, and its responsibility is to: **Develop GEO data quality assurance strategy, beginning with space-based observations and evaluating expansion to *in-situ* observations**. This task coincides mainly with the WGCV mandate.

Recommendations to Plenary:

WGCV-26 Recommendation 1:

Request that CEOS members ensure that all future missions include a quality assurance component, stating the products higher and lower accuracy requirements.

WGCV-26 Recommendation 2:

CEOS recommends that member space agencies coordinate efforts with existing cal/val archives and that member agencies supply the necessary resources to implement the requirement to establish uniform data protocols for collecting, archiving, and accessing validation data across Earth science disciplines.

WGCV-26 Recommendation 3:

CEOS requests that their *operational* member agencies (e.g. WMO, NOAA, EUMETSAT, USGS, etc.) devise a comprehensive cal/val plan that meets the needs of the *extended* (e.g. research) user community.

WGCV-26 Recommendation 4:

CEOS requests that all member agencies:

- provide support to perform additional ground measurements for direct validation, taking advantage of already existing networks;
- prepare subsets of data/products for global land product inter-comparisons, as described by CEOS/WGCV/LPV;
- support the actual processing of these data sets and the dissemination of the corresponding validation results.

Joint WGCV-25/WGISS-21 Request/Recommendation:

Request CEOS endorsement of a joint GEO/CEOS Workshop on Cal/Val Processes (to be held in October 2007 at the GEO Secretariat in Geneva). Recommend CEOS encourage continued support by appropriate members to address issues associated with the operationalization of capabilities developed by the CEOS WTF and the ESA Cal/Val Portal.

10.3 WGEdu

Yolanda Berenguer, Chair of the WGEdu, reported on the status of the group since its creation, and made a summary of the history of the group:.

- WGEdu was formed in 1999 as an ad hoc group to work on education and training activities, particularly taking into account the needs of developing countries, and was formally established in 2001
- The strategy of the group is “to establish an effective coordination and partnership mechanism among CEOS agencies and institutions offering education and training around the world. The key objective is to facilitate activities that substantially enhance international education and training.” The group is working with SIT to make sure these objectives are considered in the CEOS Implementation Plan that is under elaboration.
- The WGEdu has drafted the Principles of Satellite Data Provision. So as to ensure that the data can be actually used by providing training to the users and building capacity.
- The group meets once a year and carry out their activities through teleconferences. Agencies are invited to nominate their representatives to populate the WG.
- The group has created an Education Portal to provide reference to courses, case studies, satellite data, links to other education portals and other information relevant to the activities of the WGEdu. There is regional coordination for the inputs to the Portal:
 - Europe: ESA, EUMETSAT and NSC
 - North America: NOAA, USGS
 - Latin America: INPE
 - Africa: Nigerian National Space Research and Development Agency
 - Asia: GISTDA (not currently officially a member of WGEdu, but has offered its capacity to contribute to the Portal)All CEOS agencies are invited to contribute to the Portal with their information.
- In 2002, the CEOS WSSD (World Summit on Sustainable Development) Follow-Up Program was established as an outcome of the Johannesburg Summit, which has a Plan of Implementation making specific reference to the need of global satellite Earth observation. Interaction with the WSSD Plan is through Module 1: Capacity Building.
- WGEdu met in April 2006, and drafted a 5-year strategic plan which will be presented to the plenary in 2007.
- The objectives and activities included in the plan are:
 - Organize annual workshops and training courses in cooperation with WSSD Follow Up Program Module.
 - For 2006: Earth Remote Sensing for Secondary Teachers in Latin America, to be held in Buenos Aires, right after the 20th Plenary, with participation of teachers from Argentina and other Latin American countries (Brazil, Bolivia, Chile, Colombia, Ecuador and Uruguay), and representatives from the Ministry of Education. Funded mainly by USGS, with support by NOAA and ESA, in kind contributions by EUMETSAT, UNOOSA and UNESCO and IGWCO.
 - The WGEdu encourages all agencies to adopt Category 4 for the distribution of satellite data (Data for Education Purposes), consistently with the Principles of Satellite Data agreed by the CEOS agencies.
- WGEdu works closely with GEO Capacity Building Committee, represented by Renée Leduc Clarke (NOAA), and participated in the drafting of the GEO Capacity Building Strategy.
- WGEdu looks forward to working closely with WGISS and WGCV and have joint annual meetings and workshops and have participation from the other two WG.
- Also look forward to cooperating closely with ISPRS and SELPER.

Y. Berenguer also mentioned that Maurizio Fea (ESA) and Sergio Camacho (OOSA) will retire in 2007, leaving the group with only 8 members, and thus encouraged the agencies to nominate members to the group. The group thanked them very much for their relevant contribution.

Finally, she thanked CONAE for hosting the Workshop in Buenos Aires, providing venue, organization and logistics.

11. Agencies Update

ASI

Luigi Dini referred to the Italian agency's activities in Earth Observation. Noting the Agency's contribution to GMES. Pointed out the program for the monitoring and management of natural disasters. Seven natural disasters have been identified as priorities for Italy: Floods, Landslides, Forest Fires, Marine Oil Spills, Earthquakes, Volcanoes, Air Pollution. The agency works within the country with specialized national organizations identifying their requirements, current EO projects and required pilot projects for the development of prototype tools. Users are involved in the process, and the main user is the civil Protection Department.

Italy has an integrated EO program. With a 4 X-band radar satellites constellation for dual use COSMO SkyMed (to be launched between 2007 and 2008) and joint international cooperation, namely

- Orfeo (Optical and Radar Federated Earth Observation) with France (COSMO-skymed and Pleiades: radar and optical)
- SIASGE (Sistema Italo Argentino per la Gestione delle Emergenze), with Argentina (COSMO-Skymed and SAOCOM, X and L band radars)
- JHM (The Italian Canadian Joint Hyperspectral Mission) with Canada
- ROSA (Radio Occultation Sounder for Atmosphere studies). Two missions: 2007 on OCEANSAT-2 (India) and 2009 SAC-D (Argentina)
- EO programmes in ESA (CRYOSAT, GOCE ,ADM-Aeolus, SMOS, GMES)
- The end-users services centers: National Multi-Mission Center and the Center of Excellence on Earth Observation.

JAXA

Masatoshi Kamei briefly reported on Japan's activities, an extensive report was distributed with the documents for Plenary.

Japan approved in March 2006 the third Science and Technology research plan. ALOS Mission has finished the cal/val phase and started distribution of data products. Data can be ordered by internet at <https://cross.restec.or.jp>. Successor to ALOS is focused on capability for disaster monitoring based on the needs of national institutions. Plan is to launch 4 satellites: 2 optical and 2 radar for disaster monitoring.

International cooperation efforts to build system to share disaster information in the Asia-pacific Region to be ready by 2010. First step is to build a disaster information sharing platform. An Asia Water Resource Management Capacity Building Workshop was held on Sep 26 to 28 in Bangkok, Thailand, in response to the GEO 2006 work plan. There were 121 participants from 22 countries, including policy makers, water resource managers and researchers attended the workshop.

DLR

Klaus Schmidt also referred to the written report distributed before the Plenary. Highlights of DLR's activities:

SCIAMACHY (ENVISAT) reaches 5th year of operation,

Terrasar is ready for launch on February 27, 2007

Rapid Eye will be ready by the end of 2007 to launch th 5 satellites, having installed the mission control center and finished all required phases..

As a result of a national competition to select the continuation mission for Terrasar X with a target launch in 2009, 2 missions were selected: TanDEM-X (TerraSAR

Add-on for Digital Elevation Measurements), which is currently in Phase C/ and will be launched in March 2009, and EnMAP (Environmental Mapping and Analysis Program) will start Phase C/D by the end of 2007, and will be launched in 2011. A future imaging mission as contribution to EUMETSAT Missions is in progress. DLR works supporting GMES.

NOAA

Greg Withee presented the update from NOAA. A full report was distributed also with the Plenary's documents.

NOAA has re-establish the NPOESS program. NOAA has partnered with EUMETSAT and ESA in the METOP mission, which was launched in 2006. In 2006, as a result of a joint effort, NOAA has decided to reposition GOES-10, after the launch of GOES 12, to provide continuing coverage to the South American Region, as from November 2008. Also, there is new, state of the art operations facility in Maryland.

G. Withee also informed that this was his last CEOS meeting representing NOAA, and will be succeeded in his role by Mary Kicza. He will be working in the US GEO, coordinating the work of 18 US Agencies in support to the activities of GEOSS. He thanked the Plenary and the CEOS agencies for their constant support.

Chari Varotto thanked him for all his efforts and support in his role as CEOS Principal and presented him with a present on behalf of CEOS. The Plenary expressed its appreciation with applause.

BNSC

Paula Freedman talked briefly on behalf of BNSC, indicating a written summary had been distributed in paper to the members of the plenary, and announced that BNSC has recently started a small project on L-band SAR with CONAE in the framework of the SAOCOM mission.

CSA

Virendra Jha made a short presentation reporting on Radarsat 1 status. Informing that Radarsat 2 has been integrated, will go into testing and will be launched by April/May 2007. Canada has committed to continue C-Band data, and a SAR constellation of 3 small C-band satellites to continue the Radarsat program has been approved by the Canadian Government.

A Canadian GEO Secretary has been established.

CSA participates in TIGER project in partnership with ESA.

INPE

Gilberto Camara CBERS 2 A satellite is in orbit and CBERS 2B will be launched in May 2007. CBERS 3 and 4 will be launched in 2009 and 2012. These are in cooperation with China, with increasing Brazilian participation in each mission.

CBERS is distributed for free in Brazil and in China. So far in Brazil 260.000 scenes have been distributed through an automated system that allows the user to access the data in ten minutes. 50% is used by companies and 50% by educational centers.

Brazil also builds a multi-mission platform to be used for medium size satellites. Earth observation missions polar equatorial can handle up to 12,1 ton gross weight with 300 kg payload. The first payload is optical with global revisit period of 5 days.

Also in discussion with DLR for joint development of an L-band SAR.

Brazil is very active in use of EO data for environmental issues, especially deforestation.

EUMETSAT

Ernst Koenemann reported the launch of METOP satellite on October 9th. Instruments are working well. There have been some troubles that are currently being solved. He specially thanked G. Withee for all the support to the mission.

12. CEOS publications and www

12.1 CEOS Handbook

Evangelina Oriol-Piñerat referred to the status of the CEOS Handbook, which has been prepared based on the data in WMO database. The latest edition was released in 2005 and is available in CD-Rom and on-line. A new edition is planned for 2008. Members are encouraged to participate and WMO is asked to contribute with access to its database.

12.2 CEOS Newsletter

Kazuko Misawa reported on the status of the CEOS Newsletter was in 1993. Latest issue is N° 27, more than 4000 copies have been distributed. N° 28 will be issued in January, Members and Associates are encouraged to contribute to the edition.

4th edition of CEOS brochure was issued in 2006. JAXA proposes to update it in 2007.

IGOS brochure was also produced by JAXA in 2005, distributed in the London CEOS Plenary and IGOS-P 12bis meetings.

JAXA also works, jointly with NASA in maintaining and updating the CEOS www site.

13. Future Chairmanship

13.1 CSIR

Mrs. Pontsho Maruping, Chief Responsible for Space Science and Technology of the Department of Science and Technology of the Government of South Africa, informed that South Africa is developing the first EO Mission; it has developed an EO Strategy as part of its commitment to GEO, and is ready to commit to support the CEOS Troika in preparation for its Chairmanship in 2008.

13.2 GISTDA

Mr. Pakhorn Apaphant gave a brief report of GISTDA, the space organization of Thailand, which is developing the space program. A ground station is soon to be finished. GISTDA has long participated in CEOS, acting in the working group and also supported Thailand's activities in GEO, and is fully committed to take over the Chairmanship of CEOS in November 2008, right after South Africa.

14. Review of action items

The draft action items were reviewed briefly, and it was agreed that, the outgoing Chair (CONAE) would circulate the draft action items list for review by all participants in the near future. The list of Actions is included as Annex I.

15. Chair handover

Conrado Varotto thanked the Members for their participation

Incoming Chair Barbara Ryan (USGS) made a presentation inviting to the 21st Plenary Meeting that will take place in Mauna Lani, Hawaii, on November 13-14 2007.

She also referred to the priorities set by the CEOS Chair for 2007:

- Strengthen relations with GEO
- Support and enhance the Constellation efforts
- Promote coordination of mid-resolution imagery
- Manage the work of CEOS – GEO WPs, GCOS IP, Constellations, WGs
- Broaden commitment and energy

16. Adjourn

Barbara Ryan (Chair) confirmed the 20th CEOS Plenary adjourned.

Annex I

20th CEOS Plenary Actions

No.	Action	Due Date
20-1	CEOS Chair to convey the acceptance and appreciation of CEOS in a letter to GISTDA in response to their offer to serve as CEOS Chair agency in 2008-9	December 2006
20-2	CEOS agencies to provide any comments to SIT Chair on the outline of the CEOS Implementation Plan for Space-observations for GEOSS	30 November 2006
20-3	CEOS agencies to provide any comments to SIT Chair on the draft Constellations Process Paper	30 November 2006
20-4	SIT Chair to confirm senior SIT Liaisons proposed to help mentor Constellation Study teams	30 November 2006
20-5	SIT Chair, assisted by SIT Liaisons, and in consultation with relevant Principals, to work with Constellation Study Leads to define the inter-agency agreements required as the basis for each Constellation – and to scope an outline timetable for their execution	January 2007
20-6	SIT Chair, in consultation with CEOS Chair, and supported by the IP Task Force, to develop a Work Plan for further development of the Implementation Plan in 2007 – including results for the GEO Summit and encompassing the Constellations, Climate Chapter actions etc	February 2007
20-7	JAXA to further develop the long-term targets for the GEOSS space segment analysis for integration into the CEOS Implementation Plan document	October 2007
20-8	ESA to write to CEOS Chair confirming their willingness to support the new post of CEOS Executive Secretary (or whatever title is ultimately decided by CEOS SEC) for the initial period of 2 years from 1 st January 2007	December 2006
20-9	CEOS Chair, supported by CEOS SEC, to review CEOS Terms of Reference and structure texts to consider whether revisions are necessary to reflect appointment of the new Executive Secretary position	June 2007
20-10	CEOS Chair to report to Plenary 2007 on how effective the Executive Secretary position has been in achieving the envisaged goals	November 2007
20-11	CEOS SEC agencies to consider USGS appeal for additional SEC manpower in 2007 to address the heavy workload	January 2007

	resulting from the CEOS IP development and other activities	
20-12	CEOS Agencies invited to send to BNSC any comments they may have on the BNSC paper on engagement of the Commercial Sector in the CEOS IP. BNSC to pass on consolidated comments to the CEOS IP Task Force.	15 December 2006
20-13	CEOS Agencies to review Version 3 of the GEO 2007-9 Work Plan, in advance of GEO-III and to send comments to Jean-Louis Fellous on their potential contributions to WP Tasks	22 November 2006
20-14	CEOS Chair, supported by CEOS SEC, to formulate a response to the recent communications from WCRP & GCOS	December 2006
20-15	Space frequency questionnaire will be updated annually. BNSC has offered to make the update for 2007 and agencies are urged to respond. Agencies are asked to provide relevant point of contact to BNSC. Agencies are encouraged to respond fully the questionnaire when next issued.	
20-16	Radio Frequency issues to be added as a permanent item in the Plenary Agenda	November 2007
20-17	CEOS Members to forward any nominations for future WGISS Chair to Ivan Petiteville	15 January 2007
20-18	CEOS Agencies to consider reviewing (and increasing) the level of staff resources supplied to WGISS in light of the increased demands resulting from WGISS efforts in support of GEO activities	21 May 2007 (WGISS-23 meeting)
20-19	CEOS Members to provide feedback on the WGISS proposal to organize an annual CEOS-level conference to address all issues related to space contribution to GEO with the participation of end-users, scientists, politics, commercial sector,	31 December 2006
20-20	CEOS Members to consider nominating representatives to WGEdu in light of increased commitment to education and capacity building.	30 January 2007
20-21	CEOS Principals to consider designating a contact person in their agency for test implementation of "Principles of Satellite Data Provision" for education purposes. (Principles endorsed at 18th Plenary, 2004)	30 January 2007
20-22	CEOS member agencies review and support the four WGCV recommendations approved at the CEOS 20th Plenary (See Annex II)	
20-23	CEOS provides endorsement, and request members to send representatives to a joint GEO/CEOS Workshop on Cal/Val Processes (to be held in October 2007 at the GEO Secretariat in Geneva)	

Open actions from previous Plenary

19-4	SIT Chair to take account of the CEOS WG Recommendations to 19 th CEOS Plenary when reviewing WG structure, terms of reference, and tasking in support of the CEOS Implementation Plan. WG capacity to undertake the required CEOS Implementation Plan tasks should also be considered.	Ongoing
CTF-8	Working Groups Chairs should be actively engaged in development of the relevant parts of the CEOS Implementation Plan. Working Group Chairs to plan their activities and meetings to best meet the needs of the CEOS implementation plan targets allocated to them, and should report progress regularly to Chair of SIT.	Ongoing
CTF-9	Working Group reports to Plenary should focus on CEOS implementation plan activities but include R&D activities as appropriate.	Ongoing
CTF-10	Once the conclusions of the review of CEOS Working Groups are clear, SIT Chair to write to CEOS Principals to encourage them to review their agency's membership to CEOS Working Groups in order to provide them with the necessary expertise and resources to accomplish their work.	Pending WGISS Chair report echoes this request

Annex II

WGCV recommendations presented at the CEOS 20th Plenary

WGCV-26 Recommendation 1:

Request that CEOS members ensure that all future missions include a quality assurance component, stating the products higher and lower accuracy requirements.

WGCV-26 Recommendation 2:

CEOS recommends that member space agencies coordinate efforts with existing cal/val archives and that member agencies supply the necessary resources to implement the requirement to establish uniform data protocols for collecting, archiving, and accessing validation data across Earth science disciplines.

WGCV-26 Recommendation 3:

CEOS requests that their *operational* member agencies (e.g. WMO, NOAA, EUMETSAT, USGS, etc.) devise a comprehensive cal/val plan that meets the needs of the *extended* (e.g. research) user community.

WGCV-26 Recommendation 4:

CEOS requests that all member agencies:

- provide support to perform additional ground measurements for direct validation, taking advantage of already existing networks;
- prepare subsets of data/products for global land product inter-comparisons, as described by CEOS/WGCV/LPV;
- support the actual processing of these data sets and the dissemination of the corresponding validation results.

ANNEX III

CEOS Executive Secretary

Terms of Reference

A CEOS agency is willing to provide a suitably qualified person to act as Executive Secretary of CEOS for a period of two years from (nominally) 1st January 2007.

During this period the CEOS Chair and Strategy Group will refine these initial Terms of Reference of the Executive Secretary in time for the replacement in two years' time.

The Executive Secretary will report to the CEOS Chair. In areas where the CEOS Chair has delegated authority to the SIT Chair, the Executive Secretary will report to the SIT Chair and will additionally keep the CEOS Chair informed.

The Executive Secretary will be an *ex officio* member of the CEOS Chair's Strategy Group and in this capacity will service meetings or teleconferences of the Group.

The Executive Secretary will similarly be an *ex officio* member of the CEOS Implementation Plan Task Force.

At least in the initial period of two years, the Executive Secretary will concentrate on ensuring the efficient conduct of the CEOS contribution to GEO – including the response to the GCOS IP the GEO 2006 WP, the GEO 2007-2009 WP and the Constellations.

The Executive Secretary will oversee the day to day work of the CEOS Secretariat.

The CEOS Chair will report to Plenary 2007 on how effective this new position has been in achieving the goals CEOS has set for itself.

Annex IV

CEOS Resolution

DRAFT

DRAFT

CEOS RESOLUTION

CEOS OBJECTIVES FOR WORLD RADIOCOMMUNICATION CONFERENCES

CEOS,

CONSIDERING

- a) that its member agencies are vitally interested in achieving changes to the International Telecommunications Union (ITU) Radio Regulations (RR) in order to enhance future space science system operations, and to improve Disaster Prediction, Disaster Detection and Disaster Mitigation space systems;
- b) that changes to the RR can only be accomplished at World Radiocommunication Conferences (WRCs);
- c) that on the agendas of all of these WRCs, items of interest to CEOS member agencies may be included;
- d) that it is essential for CEOS member agencies to coordinate their conference preparations and to provide the necessary rationale for their requirements in order to achieve the desired results at WRCs;

NOTING

The Objectives of the Space Frequency Coordination Group for WRC-07 (Annex I);

that consideration of the frequency allocations required to implement space systems to be used in Disaster Prediction, Disaster Detection, Disaster Mitigation and Environmental Monitoring is critical for Public Safety and Property Protection;

RESOLVES

1. to adopt the Objectives of the Space Frequency Coordination Group for WRC-07 (Annex I) as CEOS objectives for WRC-07;
2. that consideration of CEOS WRC Objectives for the next and subsequent competent conferences identified in Annex 1 is vital for member agencies;
3. that member agencies will urge their administrations to make proposals to competent WRCs which satisfy these Objectives.

Annex 1 to CEOS Resolution
SFCG WRC-07 Objectives

**OBJECTIVES OF THE
SPACE FREQUENCY COORDINATION GROUP (SFCG)
FOR THE 2007
WORLD RADIOCOMMUNICATION CONFERENCE**

Introduction

These are the objectives of the Space Frequency Coordination Group (SFCG) member agencies relative to the space science services on the agenda of the 2007 World Radio Communication Conference (WRC-07). These positions have been agreed among all the 24 space agencies participating to SFCG, representing all the major space agencies of the world. The contents may be used by SFCG members to inform their Administrations and Regional Organizations about the SFCG position on the various relevant WRC-07 Agenda items. The document is also meant to provide support in the WRC-07 preparation.

The presentation is organized to align with the Agenda for the WRC-07, as presented in Resolution 802 (WRC-03). Not all of the items in that agenda are of interest to the SFCG and therefore only those specific agenda items, relating to SFCG issues, are discussed herein.

It is to be noted that SFCG promotes spectrum efficiency and recognizes the need for and the value of sharing frequency bands between more than one radio service, in cases where mutually agreed sharing and protection criteria have been established based on the results of ITU-R studies.

Among all the various space science services, a particular attention is placed by SFCG on the use of space-based passive sensors that provide vital ecological and environmental data unobtainable by any other means. Such passive sensors depend for their successful operation on frequency bands that are defined by the physical laws of the atmosphere.

Agenda Item 1.2 “to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions 746 (WRC-03) and 742 (WRC-03)”

Resolution 746 (WRC-03) resolves 1 calls for sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum. This will satisfy the requirement for the transmission of data from high resolution sensors on the next generation geostationary meteorological satellites, which will be launched in the time-frame 2015-2020.

SFCG Objective

SFCG supports the expansion of the current 18 GHz allocation for transmission of high rate data from geostationary meteorological satellites. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations’ preparatory processes for the CPM and WRC-07. Either sub-band within 18.0-18.4 GHz would be acceptable but it would be preferred to have a global allocation.

Resolution 746 (WRC-03) resolves 2 calls for sharing analyses between the EESS (passive) and the SRS (passive) and the fixed and mobile services in the band 10.6-10.68 GHz to determine appropriate sharing criteria. The EESS (passive) operating in the band 10.6-10.68 GHz may experience harmful interference from the emissions of systems of active services. The band 10.6-10.68 GHz is primarily used for the measurement of rain, snow, sea state, ocean wind and soil moisture.

SFCG Objective

SFCG supports the protection of this EESS (passive) allocation that is critically required to provide continued availability of satellite-based data used in the disaster prediction and in the development of global weather and climate models, from interference from the active service systems operating in the 10.6-10.68 GHz band. Revisions to RR No. 5.482, that specify operational limits on the technical characteristics of the terrestrial active services sharing the band (FS and MS), are needed. SFCG prefers that the values of the existing No. 5.482 be modified using single-entry emission limits identified in Method B1 in the draft CPM Report, with impacts on both the active and passive services in the band. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations’ preparatory processes for the CPM and WRC-07.

Resolution 742 (WRC-03) calls for sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria. EESS (passive) systems may experience harmful interference if a high density of fixed or mobile service stations is deployed in the band 36-37 GHz. The band 36-37 GHz is primarily used for the measurement of rain, snow, ocean ice, oil spills and clouds.

SFCG Objective

SFCG supports the protection of this EESS (passive) allocation that is critically required to provide continued availability of satellite-based data used in the development of disaster prediction, weather and climate models on a global scale, from interference from the active service systems operating in the 36-37 GHz band. Studies have shown that limitations on the technical characteristics of the terrestrial active services sharing the band are needed. SFCG prefers that the limits identified in Method C1, in the draft CPM Report, which will impact both the active and passive services in the band, be included in Article 5 of the Radio Regulations. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations’ preparatory processes for the CPM and WRC-07.

Agenda Item 1.3 “in accordance with Resolution 747 (WRC-03), consider upgrading the radiolocation service to primary allocation status in the bands 9 000-9 200 MHz and 9 300-9 500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (active) and the space research service (active) in the band 9 500-9 800 MHz without placing undue constraint on the services to which the bands are allocated”

Resolution 747 (WRC-03) calls for the technical characteristics, protection criteria, and other factors of radiolocation, radionavigation, EESS (active) and space research (active) systems that ensure compatible operations in the band 9 300-9 500 MHz and the study of the compatibility between terrestrial radars of the radiolocation and radionavigation services, and spaceborne radars of the Earth exploration-satellite and space research services in the band 9 300-9 500

MHz. In the event that sharing studies in the 9 300-9 500 MHz band lead to unsatisfactory conclusions which do not fully satisfy the requirement for an increase by up to 200 MHz of contiguous spectrum for EESS (active) and space research (active) services, additional sharing studies in the alternative frequency range 9 800-10 000 MHz are to be performed.

SFCG Objective

SFCG supports a 200 MHz extension to the current 9.5-9.8 GHz allocation to both the EESS (active) and SRS (active). SFCG prefers the extension to be in 9.3-9.5 GHz band as given in Method A in the draft CPM Report. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.4 "to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account of the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03)"

Any allocation to the IMT-2000 systems in bands already allocated to the meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research services could pose a threat to those services.

SFCG Objective

The SFCG objective is to protect space science services allocations that may be considered for allocation to IMT-2000 and future systems, and support suppression of Resolution 228 (Rev. WRC-03). The 410-430 MHz and 2700-2900 MHz bands have been identified as candidate bands for IMT-2000 and systems beyond IMT-2000. SFCG members view the identification of these two bands for IMT-2000 and systems beyond IMT-2000 with concern, realising the possibility of interference to manned space systems and meteorological radars and are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.5 "to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution 230 (WRC-03)"

Resolution 230 (WRC-03) calls for additional allocations between 3 and 30 GHz for wideband aeronautical telemetry and associated telecommand. The impacts to existing allocations to meteorological aids, meteorological satellite, Earth exploration-satellite, and space research need to be considered as new allocations to wideband aeronautical telemetry and associated telecommand are pursued.

SFCG Objective

The SFCG objective is to protect existing space science services allocations and to support the efforts that may lead to appropriate additional allocations in the 3 to 16 GHz band for aeronautical telecommand and high bit-rate aeronautical telemetry, which may also be used during atmospheric testing by space agencies. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.6 "to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution 414 (WRC-03) and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution 415 (WRC-03)"

Resolution 414 (WRC-03) calls for a review of bands allocated to aeronautical systems in the frequency range between 108 MHz and 6 GHz, and to determine whether additional allocations to the aeronautical mobile (R) service are required. The band 5 091-5 150 MHz is of particular interest.

Existing allocations to meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research need to be taken into account during the studies of possible new allocations to the aeronautical mobile service.

SFCG Objective

The SFCG objective is to protect existing space science services allocations in the frequency range between 108 MHz and 6 GHz. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.7 "to consider the results of ITU-R studies regarding sharing between the mobile-satellite service and the space research service (passive) in the band 1 668-1 668.4 MHz, and between the mobile-satellite service and the mobile service in the band 1 668.4-1 675 MHz in accordance with Resolution 744 (WRC-03)"

Resolution 744 (WRC-03) calls for studies relating to provisions to protect space research (passive) space stations from harmful interference from mobile earth stations in the band 1 668-1 668.4 MHz.

SFCG Objective

SFCG supports the protection of the space research service (passive) allocation in the band 1668-1668.4 MHz by means of e.i.r.p. limits applied to output of MSS stations. Interested SFCG members are encouraged to take an active role in the development of proposals and positions within respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.8 "to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution 145 (WRC-03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution 122 (Rev.WRC-03)"

Resolution 145 (WRC-03) calls for technical sharing criteria or high altitude platform stations (HAPS) system design conditions to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz. The 31.3-31.8 GHz band is allocated to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. WRC-03 amended No. 5.543A to specify signal levels that would protect satellite passive services and radio astronomy stations in the band 31.3-31.8 GHz.

SFCG Objective

SFCG supports the need for protection of the 31.3-31.8 allocation to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. The maximum levels of unwanted emissions by HAPS in the passive band contained in RR No. 5.543A must continue to apply. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda Item 1.12 "to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002): "Coordination and notification procedures for satellite networks" in accordance to Resolution 86 (WRC-03)

Resolves 1 of Resolution 86 calls for consideration of any proposals which deal with deficiencies in the advance publication, coordination and notification procedures of the Radio Regulations for space services which have either been identified by the Board and included in the Rules of Procedure or which have been identified by administrations or by the Bureau, as appropriate.

Currently Appendix 4 makes many fields optional for the case of "Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9". These fields include i) the necessary bandwidth; ii) the carrier frequency or frequencies of the emission; iii) the maximum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type; iv) the minimum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type; v) the minimum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type; and vi) the required C/N ratio. While most administrations have been supplying this information with their API filings, there have been instances where the information was not made available since many of the fields are optional. In order to do an interference analysis this information is required. To have this information not required until the notification stage makes any analysis too late to benefit either administration.

There is a significant difference between space telecommunication systems and EESS/SRS satellite systems employing active/passive sensors. The data set to be submitted in accordance with the current Appendix 4 of RR does not take into account the specificity of active/passive sensors. It would be preferable to introduce an additional column(s) into "Table of characteristics to be submitted for space and radio astronomy services" (Annex 2 to Appendix 4 RR) similar to the existing column for Radio astronomy.

SFCG Objective

SFCG supports consideration by the Special Committee for regulatory/procedural matters of modifications to Appendix 4:

- to require information that is currently optional in the Advance publication of non-geostationary satellite networks not subject to coordination under Section II of Article 9 to become mandatory. The recommended Appendix 4 data is given in Annex 1 to this document.
- to permit recording and publication of appropriate data pertaining to EESS and SRS active and passive sensors in the International Master Frequency Register (MIFR) by introducing appropriate modifications to Appendix 4 to the Radio Regulations (see example in Annex 2 to this document).

SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the Special Committee, CPM and WRC-07.

Agenda item 1.17 "to consider the results of ITU-R studies on compatibility between the fixed-satellite service and other services around 1.4 GHz, in accordance with Resolution 745 (WRC-03)"

Resolution 745 (WRC-03) calls for studies, including the measurement of emissions from equipment that would be employed in operational systems, to validate that the systems meet all requirements for the protection of passive services in the band 1 400-1 427 MHz from unwanted emissions from FSS feeder links for non-GSO satellite systems in the MSS with service links operating below 1 GHz, and to study the power flux-density (pfd) values required to protect sensors of the EESS (passive) operating in the band 1400-1427 MHz.

SFCG Objective

SFCG supports the suppression of the provisional allocation made to FSS feeder links for non-GSO satellite systems in the MSS with service links operating below 1 GHz (RR No. 5.339A) - (Method 1 in the draft CPM text). It is further recognised in the draft CPM text that MSS is not compatible with RLS and MS.

Agenda item 1.18 "to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution 141 (WRC-03)".

Resolution 141 (WRC-03) calls for studies to determine whether the current pfd limits for non-GSO systems in the FSS in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-geostationary systems without unduly constraining the use of these non-GSO FSS systems, and to determine whether there are technical and operational measures in the band 17.7-19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations. The band 18.1-18.3 GHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis, limited to geostationary satellites and in accordance with the provisions of Article 21, Table 21-4, under RR No. 5.519. Modification to pfd limits may adversely impact the sharing situation with the MetSat service in the required 100 MHz extension within the range 18.0 to 18.4 GHz. The band 18.6-18.8 GHz is allocated to EESS (passive) and SRS (passive).

SFCG Objective

SFCG supports the protection of existing science services allocations. Potential modifications to the pfd limits should not be permitted to have an adverse impact on the extension of the MetSat allocation in the range 18.0 to 18.4 GHz. WRC decisions should not relax the pfd limits that protect the passive service allocation in 18.6-18.8 GHz. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

Agenda item 1.20 "to consider the results of studies, and proposals for regulatory measures regarding the protection of the Earth exploration-satellite service (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03)"

Resolution 738 (WRC-03) calls for studies on the compatibility analyses between EESS (passive) and the corresponding active services in certain bands listed below with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations.

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service) and space research service* (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹Studies in this band must take into account No. 5.340.1 of the Radio Regulations.

* An apparent anomaly is present in the text of Resolution 738 (WRC-03) with respect to the active services in the band 1 427-1 429 MHz. According to the Table in the Resolution, the fixed, mobile (except aeronautical mobile) and space research (Earth-to-space) services are to be considered in this band. In fact, the band 1 427-1 429 MHz is allocated to the fixed, mobile (except aeronautical mobile) and space operation (Earth-to-space) services.

Resolves 2 of Resolution 738 (WRC-03) invites the ITU-R to further study the impact of implementing the values provided in *considering f)* and *g)* for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated.

SFCG Objective

SFCG supports the protection of these EESS (passive) allocations that are critically required to provide continued availability of satellite-based data used in disaster prediction and in the development of global weather and climate models. Appropriate mandatory power limits for unwanted emissions developed on a band-by-band basis, as identified by Method A in the draft CPM Report, would be most effective if included in the Radio Regulations. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07 with the aim of developing appropriate measures to ensure the protection of the Earth exploration satellite service (passive) from unwanted emissions.

Agenda item 7.1 "to consider and approve the Report of the Director of the Radiocommunication Bureau on inconsistencies encountered in the application of the Radio Regulations, and action in response to Resolution 80 (WRC-2000)" Resolution 951 (WRC-03) calls for studies to be carried out by ITU-R to examine the effectiveness, appropriateness and impact of the Radio Regulations, with respect to the evolution of existing, emerging and future applications, systems and technologies, and to identify options for improvements in the Radio Regulations.

SFCG Objective

SFCG supports the opportunity to improve the Radio Regulations. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for WRC-07 in regard to the review and comment on the Report of the Director of the Radiocommunication Bureau. With respect to Resolution 951, SFCG supports maintaining the definitions used by the space science services (current practice).

Agenda Item 7.2 "to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 803 (WRC-03)"

SFCG Objectives with respect to the draft Agenda for WRC-2010

SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes with a view to include the following items in the agenda of WRC-10:

- **WRC-2010 Agenda Item 2.2**

WRC-2010 preliminary draft Agenda item 2.2 “to consider frequency allocations between 275 GHz and 3 000 GHz taking into account the result of ITU-R studies in accordance with Resolution 950 (WRC-03)”.

The SFCG supports replacement of this Agenda item with one that reviews and revises RR No. 5.565 to update the uses of the spectrum from 275 to 3 000 GHz by the Earth exploration-satellite (passive), radio astronomy, and space research (passive) services. Moreover, the lack of use by the various active services indicates that the consideration of frequency allocations between 275 GHz and 3 000 GHz taking into account the result of ITU-R studies in accordance with Resolution 950 (WRC-03) is premature.

The revision of Resolution 950 (WRC-03) is needed and the consequent replacement of the existing WRC-2010 Agenda Item 2.2.

- **Allocation for SRS within 22.55 – 23.55 GHz**

With a view to obtaining a new allocation, SFCG would like to get an agenda item on the WRC-2010 Agenda. This AI would request that the Conference consider adding a primary space research service (Earth-to-space) allocation, up to 500 MHz wide, which could provide the needed companion to the existing 25.5-27 GHz band. The preferred band would be 22.55-23.05 GHz.

- **Protection of 37 GHz**

The SFCG should advocate the introduction of a change to the Table of Frequency Allocations precluding the operation of aeronautical mobile transmissions in the band 37-38 GHz, to improve the sharing situation between the mobile service and the space research service.

Preliminary WRC-2010 Agenda Items (see Resolution 893 (WRC-03)) that are of concern to the SFCG and should be closely monitored:

Agenda item 2.7

“to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the 81-86 and 92-100 GHz frequency bands, taking into account Resolutions 731 (WRC-2000) and 732 (WRC-2000)”

Agenda item 2.8

“to consider the progress of the ITU-R studies concerning the development and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Recommendation 951 (WRC-03) and to take any appropriate action on this subject”

ANNEX I

SFCG proposed configuration of Appendix 4 of the Radio Regulations concerning optional Data elements for Advance Publication of non-geostationary satellite networks not subject to coordination under Section II of Article 9 of the Radio Regulations

Currently Appendix 4 makes many fields optional for the case of "Advance publication of a non-geostationary satellite network not subject to coordination under Section II of Article 9". These fields include i) the necessary bandwidth; ii) the carrier frequency or frequencies of the emission; iii) the maximum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type; iv) the minimum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type; v) the minimum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type; and vi) the required C/N ratio. While most administrations have been supplying this information with their API filings, there have been instances where the information was not made available since many of the fields are optional. In order to do an interference analysis this information is required. To have this information not required until the notification stage makes any analysis too late to benefit either administration.

APPENDIX 4

ANNEX 2 Characteristics of satellite networks, earth stations or radio astronomy stations

MOD

Table of characteristics to be submitted for space and radio astronomy services
(WRC-07)

Items in Appendix	<p align="center">C - CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>	<p align="center">Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9</p>
C.7	<p align="center">NECESSARY BANDWIDTH AND CLASS OF EMISSION (in accordance with Article 2 and Appendix 1)</p>	
C.7.a	the necessary bandwidth and the class of emission: for each carrier In the case of Appendix 30B, required only for notification under Article 8	OX
C.7.b	the carrier frequency or frequencies of the emission(s)	OX
C.8	<p align="center">POWER CHARACTERISTICS OF THE TRANSMISSION</p>	
C.8.a	<p align="center">For the case where individual carriers can be identified:</p>	
C.8.a.1	the maximum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type Required if C.8.b.1 is not provided	O ₊
C.8.a.2	the maximum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type ² Required if C.8.b.2 is not provided	+
C.8.b	<p align="center">For the case where it is not appropriate to identify individual carriers:</p>	

C.8.b.1	<p>the total peak envelope power, in dBW, supplied to the input of the antenna</p> <p>For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control</p> <p>Required if C.8.a.1 is not provided</p>	⊖±
C.8.b.2	<p>the maximum power density, in dB(W/Hz), supplied to the input of the antenna²</p> <p>For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control</p> <p>Required if C.8.a.2 is not provided</p>	+
C.8.c.1	<p>the minimum value of the peak envelope power, in dBW, supplied to the input of the antenna for each carrier type</p> <p>If not provided, the reason for absence under C.8.c.2</p>	⊖±
C.8.c.2	<p>if C.8.c.1 is not provided, the reason for absence of the minimum value of the peak envelope power</p>	±
C.8.c.3	<p>the minimum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type²</p> <p>If not provided, the reason for absence under C.8.c.4</p>	⊖±
C.8.c.4	<p>if C.8.c.3 is not provided, the reason for absence of the minimum power density</p>	±
C.8.d.1	<p>the maximum total peak envelope power, in dBW, supplied to the input of the antenna for each contiguous satellite bandwidth</p> <p>For a satellite transponder, this corresponds to the maximum saturated peak envelope power</p> <p>Required only for a space-to-Earth or space-to-space link</p>	⊖
C.8.d.2	<p>each contiguous satellite bandwidth</p> <p>For the maximum saturated peak envelope power of the satellite transponder, this corresponds to the bandwidth of each transponder</p> <p>Required only for a space-to-Earth or space-to-space link</p>	⊖
C.8.e.1	<p>for space-to-Earth, Earth-to-space or space-to-space links, for each carrier type, the greater of either the carrier-to-noise ratio, in dB, required to meet the performance of the link under clear-sky conditions or the carrier-to-noise ratio, in dB, required to meet the short-time objectives of the link inclusive of necessary margins</p> <p>If not provided, the reason for absence under C.8.e.2</p>	⊖±
C.8.e.2	<p>if C.8.e.1 is not provided, the reason for absence of the carrier-to-noise ratio</p>	±

KEY: X = mandatory information
 + = mandatory under conditions specified in column 2

Reasons: Modify the “Advance publication of a non-geostationary-satellite network not subject to coordination under Section II of Article 9” to make additional technical information mandatory at the API stage.

ANNEX 2

**SFCG proposed configuration of
Appendix 4 of the Radio Regulations Data for Coordination and Notification
concerning filing of active and passive space sensor systems**

There is a significant difference between space telecommunication systems and EESS/SRS satellite systems employing active/passive sensors. The data set to be submitted in accordance with the current Appendix 4 of RR does not take into account the specificity of active/passive sensors. It would be preferable to introduce additional columns into "Table of characteristics to be submitted for space and radio astronomy services" (Annex 2 to Appendix 4 RR) similar to the existing column for Radio astronomy as shown below.

MOD

APPENDIX 4

Table of characteristics to be submitted for space and radio astronomy services (WRC-03)

Items in Appendix	A - GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION	Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a non-geostationary satellite network	Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a geostationary satellite network
A.1	IDENTITY OF THE SATELLITE NETWORK, EARTH STATION OR RADIOASTRONOMY STATION		
A.1.a	the identity of the satellite network	X	X
A.1.f.1	the symbol of the notifying administration (see the Preface)	X	X
A.1.f.2	if the notice is submitted on behalf of a group of administrations, the symbols of each of the administrations in the group, submitting the information on the satellite network (see the Preface)	+	+
A.1.f.3	if the notice is submitted on behalf of an intergovernmental satellite organization, the symbol of that organization (see the Preface)	+	+
A.2	DATE OF BRINGING INTO USE		
A.2.a	the date (actual or foreseen, as appropriate) of bringing the frequency assignment (new or modified) into use The date of bringing into use denotes the date at which the frequency assignment is brought into regular operation* to provide the published radiocommunication service with the technical parameters within the technical characteristics notified to the Bureau Whenever the assignment is changed in any of its basic characteristics (except in the case of a change under A.1.a, the date to be given shall be that of the latest change (actual or foreseen, as appropriate) * Pending further studies by ITU-R on the applicability of the term "regular operation" to non-geostationary satellite networks, the condition of regular operation shall be limited to geostationary satellite networks	X	X
A.2.b	for a space station, the period of validity of the frequency assignments (see Resolution 4 (Rev. WRC-03))	X	X

A.3	OPERATING ADMINISTRATION OR AGENCY		
A.3.a	the symbol for the operating administration or agency (see the Preface) that is in operational control of the space station, earth station or radio astronomy station In the case of Appendix 30B, required only for notification under Article 8	X	X
A.3.b	the symbol for the address of the administration (see the Preface) to which communication should be sent on urgent matters regarding interference, quality of emissions and questions referring to the technical operation of the network or station (see Article 15) In the case of Appendix 30B, required only for notification under Article 8	X	X
A.4	ORBITAL INFORMATION		
A.4.a.1	the nominal geographical longitude on the geostationary-satellite orbit (GSO)		X
A.4.a.2.a	the planned longitudinal tolerance easterly limit		X
A.4.a.2.b	the planned longitudinal tolerance westerly limit		X
A.4.a.2.c	the planned inclination excursion		X
A.4.b.1	the number of orbital planes	X	
A.4.b.2	the reference body code	X	
A.4.b.4.a	the angle of inclination (i) of the orbital plane with respect to the Earth's equatorial plane ($0^\circ \leq i_j < 180^\circ$)	X	
A.4.b.4.b	the number of satellites in the orbital plane	X	
A.4.b.4.c	the period	X	
A.4.b.4.d	the altitude, in kilometres, of the apogee of the space station	X	
A.4.b.4.e	the altitude, in kilometres, of the perigee of the space station	X	
A.5	COORDINATIONS		
A.6	AGREEMENTS		
A.7	SPECIFIC EARTH STATION OR RADIO ASTRONOMY STATION SITE CHARACTERISTICS		
A.8	Not used		
A.9	Not used		
A.10	EARTH STATION COORDINATION AREA DIAGRAMS		
A.11	REGULAR HOURS OF OPERATION		
A.12	RANGE OF AUTOMATIC GAIN CONTROL, in dB		
A.13	REFERENCES TO THE PUBLISHED SPECIAL SECTIONS OF THE BUREAU'S INTERNATIONAL FREQUENCY INFORMATION CIRCULAR (see the Preface)		
A.13.a	the reference and number of the advance publication information in accordance with No. 9.1	X ³	X ³
A.14	FOR STATIONS OPERATING IN A FREQUENCY BAND SUBJECT TO Nos. 22.5C, 22.5D OR 22.5F: SPECTRUM MASKS		
A.15	COMMITMENT REGARDING COMPLIANCE WITH ADDITIONAL OPERATIONAL EQUIVALENT POWER FLUX DENSITY, $epfd_{\downarrow}$, LIMITS		
A.16	COMMITMENT REGARDING COMPLIANCE WITH OFF-AXIS POWER LIMITATIONS OR POWER FLUX-DENSITY, pdf, LIMITS		
A.17	COMPLIANCE WITH POWER FLUX-DENSITY, pdf, LIMITS		
A.17.d	the mean power flux-density produced at the Earth's surface by any spaceborne sensor, as defined in No. 5.549A Required only for satellite systems operating in the Earth exploration-satellite service (active) or space research service (active) in the band 35.5-36 GHz	±	±

Items in Appendix	<p align="center">B - CHARACTERISTICS TO BE PROVIDED FOR EACH SATELLITE ANTENNA BEAM OR EACH EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>	<p align="center">Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a non-geostationary satellite network</p>	<p align="center">Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a geostationary satellite network</p>
B.1	IDENTIFICATION AND DIRECTION OF THE SATELLITE ANTENNA BEAM		
B.1.a	the designation of the satellite antenna beam For an earth station, the designation of the satellite antenna beam of the associated space station	X	X
B.1.b	an indicator showing whether the antenna beam, under B.1.a, is fixed or whether it is steerable and / or reconfigurable	X	X
B.2	TRANSMISSION / RECEPTION INDICATOR FOR THE BEAM OF THE SPACE STATION OR THE ASSOCIATED SPACE STATION		
B.3	SPACE STATION ANTENNA CHARACTERISTICS		
B.3.a.1	the maximum co-polar isotropic gain, in dBi Where a steerable beam (see No. 1.191) is used, if the effective boresight area (see No. 1.175) is identical with the global service area, the maximum antenna gain, in dBi, is applicable to all points on the Earth's visible surface	X	X
B.3.c.1	the co-polar antenna radiation pattern, in the case of: – non-geostationary space stations – geostationary or non-geostationary space stations where the antenna radiation beam is directed towards another satellite – elliptical antenna beams for Appendix 30, 30A or 30B	X	X
B.4	ADDITIONAL CHARACTERISTICS FOR NON-GEOSTATIONARY SPACE STATION ANTENNA		
B.4.b.1.a	the orientation angle alpha, in degrees, (see most recent version of Recommendation ITU-R SM.1413)	X	X
B.4.b.1.b	the orientation angle beta, in degrees, (see most recent version of Recommendation ITU-R SM.1413)	X	X
Items in Appendix	<p align="center">C - CHARACTERISTICS TO BE PROVIDED FOR EACH GROUP OF FREQUENCY ASSIGNMENTS FOR A SATELLITE ANTENNA BEAM OR AN EARTH STATION OR RADIO ASTRONOMY ANTENNA</p>	<p align="center">Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a non-geostationary satellite network</p>	<p align="center">Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a geostationary satellite network</p>
C.1	FREQUENCY RANGE		
C.2	ASSIGNED FREQUENCY (FREQUENCIES)		
C.2.a.1	the assigned frequency (frequencies), as defined in No. 1.148 - in kHz up to 28 000 kHz inclusive - in MHz above 28 000 kHz to 10 500 MHz inclusive	X ¹	X ¹

	- in GHz above 10 500 MHz If the basic characteristics are identical, with the exception of the assigned frequency, a list of frequency assignments may be provided In the case of Appendix 30B, required only for notification under Article 8		
C.2.b	the centre of the frequency band observed - in kHz up to 28 000 kHz inclusive - in MHz above 28 000 kHz to 10 500 MHz inclusive - in GHz above 10 500 MHz	<u>X</u> ⁶	<u>X</u> ⁶
C.2.c	if the frequency assignment is to be filed under No. 4.4, an indication to that effect	<u>±</u>	<u>±</u>
C.3	ASSIGNED FREQUENCY BAND		
C.3.a	the bandwidth of the assigned frequency band, in kHz (see No. 1.147) In the case of Appendix 30B, required only for notification under Article 8	<u>X</u> ⁴	<u>X</u> ⁴
C.3.b	the bandwidth of the frequency band, in kHz, observed by the station	<u>X</u> ⁶	<u>X</u> ⁶
C.4	CLASS OF STATION AND NATURE OF SERVICE		
C.4.a	the class of station, using the symbols from the Preface	<u>X</u>	<u>X</u>
C.4.b	the nature of service performed, using the symbols from the Preface	<u>X</u>	<u>X</u>
C.5	RECEIVING SYSTEM NOISE TEMPERATURE		
C.6	POLARIZATION		
C.6.a	the type of polarization (see the Preface) In the case of circular polarization, this includes the sense of polarization (see Nos. 1.154 and 1.155) In the case of a space station submitted in accordance with Appendix 30 or 30A, see § 3.2 of Annex 5 to Appendix 30	<u>X</u> ³	<u>X</u> ³
C.6.b	if linear polarization is used, the angle, in degrees, measured counter-clockwise in a plane normal to the beam axis from the equatorial plane to the electric vector of the waves as seen from the satellite In the case of a space station submitted in accordance with Appendix 30 or 30A, see § 3.2 of Annex 5 to Appendix 30	<u>+</u> ³	<u>+</u> ³
C.7	NECESSARY BANDWIDTH AND CLASS OF EMISSION (In accordance with Article 2 and Appendix 1)		
C.8	POWER CHARACTERISTICS OF THE TRANSMISSION		
C.8.b.1	the total peak envelope power, in dBW, supplied to the input of the antenna For coordination or notification of an Appendix 30A earth station the values shall include the maximum range of power control For notification of active sensors the values shall include the average power, in dBW. Required if C.8.a.1 is not provided	<u>X</u> ⁴	<u>X</u> ⁴
C.9	INFORMATION ON MODULATION CHARACTERISTICS		
C.10	TYPE AND IDENTITY OF THE ASSOCIATED STATION(S) (the associated station may be another space station, a typical earth station of the network or a specific earth station)		
C.11	SERVICE AREA(S)		
C.12	REQUIRED PROTECTION RATIO		
C.13	CHARACTERISTICS OF OBSERVATIONS FOR RADIO ASTRONOMY STATIONS		
C.14	Not used		
C.15	DESCRIPTION OF THE GROUP(S) REQUIRED IN THE CASE OF NON-SIMULTANEOUS EMISSIONS		

Items in Appendix	D - OVERALL LINK CHARACTERISTICS	Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a non-recreational satellite network	Advance publication or notification of a spaceborne active or passive sensor as defined in Nos. 1.182 and 1.183 on board a recreational satellite network
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Reasons: To modify Appendix 4 in order to facilitate the filing of active and passive sensors as defined in Nos. 1.182 and 1.183 respectively.

Editorial note: ANNEX 2 mentioned below is ANNEX 2 to Appendix 4 of the Radio Regulations

MOD

ANNEX 2

**Characteristics of satellite networks, earth stations
or radio astronomy stations (WRC-03)**

Footnotes to Tables A, B, C and D

- 1 Not required for coordination under No. 9.7A.
- 2 The most recent version of Recommendation ITU-R SF.675 should be used to the extent applicable in calculating the maximum power density per Hz. For carriers below 15 GHz, the power density is averaged over the worst 4 kHz band. For carriers at or above 15 GHz, the power density is averaged over the worst 1 MHz band. In the case of assignments with a bandwidth less than the stated averaging bandwidth, the maximum density is calculated as if the assignment occupied the averaging bandwidth.
- 3 Required at notification stage only.
- 4 Required only for active sensors, as defined in No. 1.182, at notification.
- 5 Required only for passive sensors, as defined in No. 1.183, at notification.

Reasons: Consequential. Definition of footnotes inserted into the spaceborne active and passive sensor column is required. Due to the fact that active sensors are emitters and passive sensors are not, certain data elements are applicable only to one type of sensor.

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APPENDIX 4

Table of characteristics to be submitted for space and radio astronomy services (WRC-03)

Items in Appendix	A - GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK, EARTH STATION OR RADIO ASTRONOMY STATION	Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)	Notification or coordination of a non-geostationary-satellite network
A.17.d	the mean power flux-density produced at the Earth's surface by any spaceborne sensor, as defined in No. 5.549A Required only for satellite systems operating in the Earth exploration-satellite service (active) or space research service (active) in the band 35.5-36 GHz	+	+

Reasons: Consequential. The addition in Appendix 4 of data element A.17.d in the columns for spaceborne active and passive sensors makes its inclusion in the coordination and notification of satellite networks columns redundant. Therefore, it may be deleted from the two columns shown.

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20th CEOS PLENARY
Sheraton Libertador Hotel - "Salón De Las Americas"
Buenos Aires - Argentina

PRELIMINARY AGENDA

TUESDAY, NOVEMBER 14TH

09:00	1.	Welcome	Chair
	2.	Adoption of Agenda	Chair
	3.	Membership issues	Chair
	4.	Review of 19th Plenary - Status of Actions	Chair
	5.	CEOS Chair's report: 2006	Chair
10:00		BREAK	
10:30	6.	Report on development of the CEOS Implementation Plan	SIT Chair
		a. Overview	
		b. CEOS Response to GEO WP (2006 & 2007-9)	JL FELLOUS
		c. CEOS Response to GCOS IP - Inc actions for 2007	B RYAN
		d. CEOS Constellations Concept, Process Paper and Prototypes	S BRIGGS
		e. Role for commercial sector	BNSC
		f. Way forward for 2007	SIT Chair
12:30		LUNCH	
14:00	7.	Strategy discussion	
		a. Transitioning to Action	B RYAN
		b. CEOS SEC, GEO SEC and Resource Capacity	
15:30		BREAK	
16:00		c. CEOS relationship with IGOS-P	SIT Chair
		d. 2007 Calendar	B RYAN
	8.	GEO Update	GEO SEC
17:30		ADJOURN	

Reception

WEDNESDAY, NOVEMBER 15TH

09:00	9.	CEOS related radiofrequency issues	BNSC & SFCG
	10.	Working Groups Reports and Actions	
	10.1	WGISS	I PETITEVILLE
	10.2	WGCalVal	S UNGAR
10:00		BREAK	
10:30	10.3	WGEdu & WSSD Follow-up	Y BERENGUER
	11.	Agencies update	
	12.	CEOS publications and www	JAXA, NASA, ESA
	13.	Future Chairmanship	CSIR, GISTDA
	14.	Review of Action Items	Chair
	15	Chair handover	CONAE-USGS
13:00		END OF MEETING	

IGOS PARTNERS MEETING 13BIS
Room "El Portal"
Hotel Sheraton Libertador
Buenos Aires - Argentina
13 November 2006
AGENDA V1.1

Item	Lead Speaker	Timing
1. ORGANISATION OF THE SESSION	Co-Chairs	13:00-13:10
1.1 Opening of the session		
1.2 Adoption of the agenda		
1.3 Working arrangements for the session		
2. REVIEW OF PREVIOUS SESSION	Co-Chairs	13:10-13:30
2.1 Review of IGOS 13 Meeting report		
2.2 Review of outstanding action items from 12, 12bis, 13		
3. IGOS PARTNER REPORTS		
3.1 CEOS SIT Report	CEOS(SIT)	13:30-14:10
3.2 ICPC Update	ICPC(IOC)	
4. GEO/GEOSS STATUS		
4.1 IGOS-P / GEO relationship	GEO	14:10-15:00
Coffee Break		15:00-15:20
4. GEO/GEOSS		
4.2 IGOS input to GEO Workplan 2007-2009	Co-Chairs	15:20-15:40
5. THEME REPORTS UPDATES	Theme Leaders	15:40-16:40
6. OTHER BUSINESS		
6.1 Review of Action Items	Co-Chairs	16:40-17:00
6.2 Date and Venue of Next Meeting		
7. CLOSURE OF THE SESSION	Co-Chairs	17:00

	Title	Family Name	First Name	Organization	Nat	Acting as	Plenary	IGOS
1	Mrs.	ORIOI-PIBERNAT	Evangelina	ESA	SP	CO	x	x
2	Dr.	SMITH	Brent	NOAA	USA	CO	x	
3	Mr.	ALVERSON	Keith	GOOS	USA	PR	x	x
4	Mr.	INADA	Tadahiko	JAXA	JP	PR	x	
5	Mr.	ISHIDA	Chu	JAXA	JP	CO	x	x
6	Mr.	UMEZAWA	Kazuo	JAXA	JP	OFF	x	x
7	Mrs.	MISAWA	Kasuko	JAXA	JP	OFF	x	x
8	Dr.	MAEDA	Korehiro	JAXA	JP	OFF	x	
9	Dr.	TOWNSHEND	John	UMD	US	Not sure	x	x
10	Mr.	CHURCHYARD	Mark	BNSC	BR	PR	x	x
11	Ms.	FREEDMAN - BOYD	Paula	BNSC	BR	PR	x	x
12	Mr.	GIBSON	Roy	ESA	UK	AD	x	
13	Dr.	JHA	Virendra	CSA	CAN	PR	x	
14	Mr.	DE LISLE	Daniel	CSA	CAN	CO	x	
15	Mr.	BRIGGS	Stephen	ESA/ESRIN	BRI	OFF	x	x
16	Ms.	FLEMING	DeVon C.	NASA	USA	CO	x	
17	Dr.	UNGAR	Stephen	WGCV	USA	OFF	x	
18	Mr.	MISSOTTEN	Robert	UNESCO	BELG	PR	x	x
19	Dr.	VAROTTO	Conrado	CONAE	ARG	PR	x	x
20	Dr.	FRULLA	Laura	CONAE	ARG	AD	x	x
21	Dr.	HERNANDEZ	Ana Maria	CONAE	ARG	AD	x	x
22	Mrs.	MEDICO	Ana	CONAE	ARG	CO	x	x
23	Mr.	KOENEMANN	Ernst	EUMETSAT	GER	PR	x	
24	Ms.	MARUPING	Ponstsho	SCT	S. AFR	PR	x	
25	Dr.	STUART-HACQUEBARD	Venetia	IOCCG	CAN	CO	x	
26	Mr.	RAMUSI	Mothibi Glenview	CSIR	S. AFR	CO	x	
27	Prof.	MASON	Paul	GCOS	UK			x
28	Mr.	ACHACHE	José	GEO	FRA	PR	x	
29	Mr.	RUM	Giovanni	GEO	ITA	OFF	x	
30	Mr.	APAPHANT	Pakorn	GISTDA	THAI	CO	x	
31	Mrs.	DOWREANG	Darasri	GISTDA	THAI	PR	x	
32	Mr.	PLAG	Hans - Peter	NBMG	GER			x
33	Mr.	BIGOT	Jean-Charles	ESA	FRA	CO	x	
34	Mr.	KAMEI	Masatoshi	MEXT	JP	OFF	x	x
35	Mr.	ECKES	Martin	USGS	USA	OFF	x	x
36	Mr.	FELLOUS	Jean Louis	SIT			x	
37	Mr.	WARD	Stephen	SIT			x	
38	Ms.	RYAN	Bárbara	USGS	USA	PR	x	x
39	Mr.	BRADFORD	Barron	USGS	USA	CO	x	x
40	Mr.	PETTINGER	Lawrence	USGS	USA	PR	x	x
41	Dr.	BAILEY	G. Bryan	USGS	USA	AD	x	x
42	Dr.	CECIL	DeWayne	NASA	USA	AD	x	
43	Mr.	CRAMER	Bryant	NASA	USA	PR	x	
44	Mrs.	BERENGUER	Yolanda	UNESCO	FILIP	OFF	x	
45	Mr.	LIEBIG	Volker	ESA	GER	PR	x	
46	Mr.	PETITEVILLE	Ivan	PDGS	FRA	OFF	x	
47	Mrs.	ULTRE-GUERARD	Pascale	CNES	FRA	PP	x	

48	Mr.	SCHMIDT	K.P.	DLR	GER	CO	x	
49	Mr.	O'DONNELL	Brian	WMO	CAN	PR	x	x
50	Mr.	SKROVSETH	Per Erik	NSC	NORW	CO	x	
51	Dr.	CAMARA	Gilberto	INPE	BRA			
52	Mr.	CAO	Changyong	NOAA/NESDIS	USA	OFF	x	
53	Mr.	WITHEE	Gregory	NOAA	USA	OFF	x	
54	Mr.	McDONALD	Kenneth	NASA	USA	OFF	x	

Indicated intention to participate but have not sent registration form yet or are requesting entry visa

56		MILILLO	Giovanni	ASI	ITA			
57		ARRIGO	Gabriella	ASI	ITA			
58		MARELLI	Edouardo	SFCG	ITA			
59		VIANEI SOARES	Joao	INPE	BRA			
60		JIN YIMING		NRSCC	CHI			
61		YONHONG ZHANG		IPRS	CHI			
62		LIN MINGSEN		NSOAS	CHI			
63		ZHANG XIAOYE		CAMS CMA	CHI			
64		LU NAIMENG		CMA	CHI			
65		KOSTYUCHENKO	Yuriy V.		RUS			
66		KICZA	Mary	NOAA	USA			

Informed they are not attending

1		HELD	Axel	CSIRO	AUST			
2		DENIEL	Carole	CNES				
3		MENGXUE LI						
4	Mr.	COUNET	Paul	EUMETSAT	BELG	OFF	x	