

World Meteorological Organization

FIFTEENTH CONGRESS

GENEVA, 2007



**Cg-XV/Doc. 3.10**

Submitted by: Secretary-General

Date: 5.III.2007

Original Language: English

Agenda item: 3.10

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## WMO SPACE PROGRAMME (WMOSP)

### SUMMARY

#### ISSUES TO BE DISCUSSED:

To review the status of the WMO Space Programme including main accomplishments during 2004-2007 and key initiatives for 2008-2011.

#### ADDITIONAL FINANCIAL IMPLICATION:

None

#### DECISIONS/ACTIONS REQUIRED:

Congress is invited to adopt the draft text given in the Appendix for inclusion in the general summary of Cg-XV.

#### REFERENCES:

1. Resolution 5 (Cg-XIV) - WMO Space Programme
2. Resolution 6 (Cg-XIV) - WMO Consultative Meetings on High-Level Policy on Satellite Matters
3. *Sixth WMO Long-term Plan 2004-2011* (WMO-No. 962)
4. Final Report, Sixth Session, WMO Consultative Meetings on High-Level Policy on Satellite Matters (CM-6)
5. Final Report, Seventh Session, WMO Consultative Meetings on High-Level Policy on Satellite Matters (CM-7)

#### CONTENT OF DOCUMENT:

##### Appendix for inclusion in the final report:

Draft text for inclusion in the general summary Cg-XV

##### Appendix for information:

**Cg-XV/Rep. 3.10:** Progress/Activity Report

## **DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF Cg-XV**

### **3.10 WMO SPACE PROGRAMME (WMOSP) (*agenda item 3.10*)**

**3.10.1** Congress recalled that it had decided at Cg-XIV to initiate the WMO Space Programme as a major cross-cutting programme to increase the effectiveness and contributions from satellite systems to WMO Programmes. Congress reviewed the main accomplishments of the WMO Space Programme during 2004-2007 regarding improvement of the space-based GOS, enhanced access to its data and products and promotion of Members' capability to use this data through education and training. Congress also reviewed key initiatives contained within the WMO Space Programme Implementation Plan for 2008-2011, including support to global optimization of mission planning, and agreed that they would represent significant improvements and increased capabilities for WMO Members.

**3.10.2** Congress also expressed its deep appreciation to those WMO Members and EUMETSAT and ESA for their contributions to the space-based component of the GOS. In particular, Congress noted the robustness of the space-based component of the GOS, with the launch of the following geostationary satellites: MTSAT-1R, MTSAT-2, Meteosat-9, GOES-13, INSAT-3A, FY-2C and FY-2D. Concerning polar-orbiting satellites it noted the launch of NOAA-18, the launch of Metop-A with an advanced payload, as well as China's plans to launch FY-3A in September 2007 and plans of the Russian Federation to launch a METEOR-M No.1 satellite in December 2007. Several new R&D satellites were potentially contributing to the GOS: ALOS, Cloudsat and Calipso, Resurs-DK. Radio-occultation sounding data from the COSMIC constellation were also available. Congress was informed of the latest update on the contributions to the GOS as agreed with operational and R&D agencies.

**3.10.3** In view of the progress in achieving the goals stated in the WMO Space Programme Implementation Plan 2004-2007, Congress agreed that much had been accomplished to the direct benefit of WMO Members. It encouraged that continuing and enhanced efforts be made by all stakeholders to fully implement the goals.

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## **WMO SPACE PROGRAMME (WMOSP)**

### **PROGRESS/ACTIVITY REPORT**

#### **SUMMARY**

**Reference: Cg-XV/Doc. 3.10**

**CONTENT OF DOCUMENT:**

Information on activities that have occurred with regard to the WMO Space Programme including main accomplishments during 2004-2007 and key initiatives for 2008-2011.

**Appendix:**

- Progress/Activity Report

## PROGRESS/ACTIVITY REPORT

1. Fourteenth WMO Congress agreed the main thrust of the WMO Space Programme should be to make an increasing contribution to the development of the WWW Global Observing System (GOS) as well as to other WMO and supported programmes and associated observing systems through the provision of continuously improved data, products and services, from both operational and R&D satellites, and to facilitate and promote their wider availability and meaningful utilization around the globe. In addressing the directive from Fourteenth Congress, the WMO Space Programme Implementation Plan for 2004-2007 detailed a set of activities organized along four main areas: expanding the space-based GOS; enhancing access; enhancing use; and training. Major accomplishments during 2004-2007 in the four main areas as well as key initiatives that have started and will be carried forward within the WMO Space Programme Implementation Plan for 2008-2011 are described below:

### **Expanding the space-based observing system and improving its capabilities**

*(N.B. A more complete description of the space-based component of the GOS is contained in paragraph 3.10.2, the following only describes the expansion since Cg-XIV)*

#### **Major accomplishments during 2004-2007**

2. New contributing space agencies - The Korean Meteorological Agency (KMA), the Korean Aerospace Research Institute (KARI) and the Chinese National Space Administration (CNSA) have made formal commitments to WMO for their COMS-1 and HY and HJ series satellites, respectively, to be included as part of the space-based component of the GOS. KMA/KARI and CNSA join NASA, NOAA, EUMETSAT, ESA, JMA, JAXA, IMD, CMA, ROSCOSMOS and ROSHYDROMET as space agencies contributing to the GOS.

3. Update to the Implementation Plan for the space component of the GOS - The Implementation Plan for the Evolution of the Space and Surface-based Subsystems of the GOS contains 22 recommendations relevant to space-based observations that have been systematically addressed and used as guidance within the WMO Space Programme.

4. Global Contingency Planning - The draft Global Contingency Plan prepared by the WMO Space Programme Office was finalized and adopted by CGMS Members as the first version of the CGMS Global Contingency Plan. The plan was updated at CGMS-XXXIV as concerns the nominal and back-up positions for geostationary satellites.

5. Global Space-based Inter-calibration System (GSICS) - Action to establish GSICS was agreed by CGMS-XXXIII. The goal of GSICS is to ensure comparability of satellite measurements provided at different times by different instruments and programmes, and to tie these measurements to absolute references and SI standards. GSICS is expected to improve the use of space-based observations of the GOS and to enable recalibration of archived data.

6. Optimization of GEO and LEO plans – At the first WMO/CGMS Workshop on Optimization, the discussion on LEO systems focused on the distribution of Equatorial Crossing Time (ECT) of sun-synchronous satellites, comparing the planned missions for each type of payload with the GOS baseline and the underlying requirements for temporal sampling. CM-7 agreed on Workshop recommendations with respect to several particular types of instruments.

7. Response to GCOS requirements for space-based products - A preliminary analysis suggested current satellite plans provided impressive capabilities to meet most of GCOS requirements. It highlighted however a risk of gaps for some specific variables such as Earth radiation budget, sea level, sea surface winds or global precipitation. The analysis suggested re-

defining the scope of the WMO Global Observing System beyond its current objectives that are driven by operational requirements of the World Weather Watch programme taking into account the need for long-term “sustained” measurement of all Essential Climate Variables.

### ***Key initiatives for 2008-2011***

8. Update and optimization of GOS baseline - CM-7 strongly supported the proposal to convene a second Workshop on Optimization, with participation of both operational and R&D agencies, in order to assess scenarios in more detail and refine the recommendations cited in the CM-7 Report. CM-7 felt the role of the WMO Space Programme was particularly important in facilitating such discussions that have potentially a large impact on the overall efficiency of the space-based observation investment to meet global requirements.

9. CBS-Ext.(06) decided to commence an update of the baseline of the space-based GOS with 2025 as a new horizon, and expand its scope beyond the World Weather Watch in order to include sustained observations of additional variables required for climate monitoring, and ultimately to address the needs of other WMO Programmes as well.

10. IGeoLab - CM-7 supported the idea of using the IGeoLab framework for a demonstration mission based on Molniya orbits. Initiating such a project seemed particularly appropriate in the context of the International Polar Year (IPY) as it would pave the way for possible long-term sustained missions providing quasi-permanent coverage of the polar-regions.

11. Transition from Relevant R&D Instruments to Operational Missions – CM-7 agreed that improvements were possible in the transition from relevant R&D instruments to operational missions and suggested that WMO could help facilitate enhanced cooperation in this respect by preparing guidelines on the transition. It agreed that the guidelines should describe the benefits for transition by addressing issues that should be considered early in the transition process including data access, transition principles of operation, timetables and the need for user input.

### **Enhancing access to satellite data and products**

#### ***Major accomplishments during 2004-2007***

12. Integrated Global Data Dissemination Service (IGDDS) - IGDDS is a project within the WMO Information System (WIS) with a goal to ensure that WMO requirements for access to space-based observation data and products are satisfied in all WMO regions and for all WMO or co-sponsored programmes. One particular objective of IGDDS is to implement a satellite-based Digital Video Broadcast (DVB-S) dissemination service that would integrate data flows from multiple sources, with quasi-global coverage and inter-regional data exchange between the various regional hubs. This particular objective is about to be achieved through joint efforts of EUMETSAT, NOAA and CMA. Other dissemination means shall however be considered as a complement to the DVB-S broadcast, namely the GTS, Direct Readout from meteorological satellites, and the Internet.

13. Regional ATOVS Retransmission Service (RARS) - The objective of a RARS is to collect and deliver polar-orbiting sounding data for regional and global NWP with a timeliness requirement of less than 30 minutes. The global RARS network currently includes three regional RARS based in Europe, Asia-Pacific and South America respectively. The EUMETSAT EARS covers European, Atlantic, North American and Arctic areas. The global RARS network currently covered about 45% of the globe's surface at the end of 2006 and is planned to cover 62% of the globe in 2007 and 68% by the end of 2008. Further action is needed to extend the coverage towards Africa.

### ***Key initiatives for 2008-2011***

14. IGDDS and RARS – While initial capabilities have been established for both RARS and IGDDS, further developments are required. During 2008-2011, Implementation Groups for IGDDS and RARS will work towards more global coverage in response to user data and product requirements that will guide the data management aspects for inter-regional exchange. WMO will seek to ensure that the GEONETCast initiative contributes to fulfil WMO IGDDS requirements.

### **Enhancing the use of satellite data and products**

#### ***Major accomplishments during 2004-2007***

15. Regional Specialized Satellite Centres (RSSC) - CM-6 reviewed a proposal to identify specific centres of excellence in thematic areas that could be designated Regional/Specialized Meteorological Centres for Satellite Products (Regional Specialized Satellite Centres). CM-7 discussed a proposal by EUMETSAT for a high-level concept of a global network of Regional Specialized Satellite Centres on the thematic area of operational climate monitoring (RSSC-CM). The concept would address the requirements of the Global Climate Observing System (GCOS), and would utilize both environmental R&D and operational meteorological space agencies' data, as well as GSICS. The goal of a global network of RSSC-CMs would be the sustained and operational provision of high-quality data for the Essential Climate Variables (ECV products) on a global scale.

### ***Key initiatives for 2008-2011***

16. RSSC for Climate Monitoring (RSSC-CM) - CM-7 noted the proposed timetable for RSSC-CM and strongly urged all participants to work towards development and approval of an Implementation Plan. CM-7 agreed that the global network would take advantage of existing facilities and could include virtual centres, each of them having several or many physically distinct components.

### **Supporting training activities on the use of satellite observation data and products, through new Centres of Excellence and the expansion of the Virtual Laboratory**

#### ***Major accomplishments during 2004-2007***

17. Virtual Laboratory for Education and Training in Satellite Meteorology (VL) – The VL has expanded from the original set of six Centres of Excellence (CoE) (Barbados, Costa Rica, Melbourne, Nairobi, Niamey and Nanjing) to the present set of nine CoEs. Argentina agreed to establish a CoE in Buenos Aires for training in satellite meteorology in Spanish. CBS-Ext.(06) was informed that Brazil had proposed the Centre for Weather Forecast and Climate Studies of Brazil (CPTEC) as a new CoE. A new CoE in Muscat (Oman) was inaugurated on 11 February 2006.

18. High Profile Training Event (HPTE) - The HPTE was held during 16-27 October 2006. The two-week event featured regional face-to-face training activities carried out in the VL CoEs in Melbourne, Australia and Nanjing, China with support from the other VL CoEs. Each CoE established a regional focus group. An analysis at the end of the HPTE indicated that more than 2,000 participants received lectures in more than 120 WMO Member countries. Finally, a training event of the Portuguese-speaking countries ended on 20 November 2006. CPTEC/INPE was responsible for this event. They also used the four WMO key lectures and translated all key lectures into Portuguese.

***Key initiatives for 2008-2011***

19. New CoEs - Two new CoEs will be considered in 2008-2011 including appropriate reviews by CBS OPAG IOS Expert Teams and approval by CBS. In particular, the southern African region as well as a CoE where Russian would be the working language for participants.

20. HPTE – Based on the success of the HPTE, a VL Management Group will consider a structured approach to benefit from capabilities demonstrated during the HPTE with the expectation that more training will be accomplished under the HPTE concept rather than the present traditional short-term classroom approach. Consideration will also be given to implementation of regional HPTEs to complement global ones.

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