WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS

OPAG ON INFORMATION SYSTEMS AND SERVICES

PREPARATORY WORKSHOP FOR THE ESTABLISHMENT OF AN INTERNATIONAL FORUM OF USERS OF SATELLITE DATA TELECOMMUNICATIONS SYSTEMS (SATCOM FORUM)

Toulouse, France, 23-27 April 2012

FINAL REPORT

DISCLAIMER

Regulation 42

Recommendations of working groups shall have no status within the Organization until they have been approved by the responsible constituent body. In the case of joint working groups the recommendations must be concurred with by the presidents of the constituent bodies concerned before being submitted to the designated constituent body.

Regulation 43

In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation on behalf of the constituent body when the matter is, in his opinion, urgent, and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).

Chairperson, Publications Board
World Meteorological Organization (WMO)
7 bis, avenue de la Paix
P.O. Box No. 2300
CH-1211 Geneva 2, Switzerland

Tel.: +41 (0)22 730 84 03
Fax: +41 (0)22 730 80 40
E-mail: Publications@wmo.int

NOTE:

The designations employed in WMO publications and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of WMO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Opinions expressed in WMO publications are those of the authors and do not necessarily reflect those of WMO. The mention of specific companies or products does not imply that they are endorsed or recommended by WMO in preference to others of a similar nature which are not mentioned or advertised.

This document (or report) is not an official publication of WMO and has not been subjected to its standard editorial procedures. The views expressed herein do not necessarily have the endorsement of the Organization.

_____

CONTENTS

_____

[Page left intentionally blank]

EXECUTIVE SUMMARY

The preparatory workshop for the establishment of an international Forum of users of satellite data telecommunication systems (Satcom Forum) was held in the international conference centre of Météo France in Toulouse, France, from 23 to 27 April 2012, and was chaired by Mr David Meldrum (United Kingdom).

The future Forum is meant to provide an international mechanism, covering the wide user base that exists within the co-sponsoring Organizations, to address remote data communication requirements – including tariff negotiations as needed – for automatic environment observing systems using satellite data telecommunication systems (Satcom systems).

The workshop reviewed the WMO and IOC user requirements for the collection of meteorological data from remote areas (including Automatic Weather Stations, Polar Observations, Buoys and Floats, Ships, Sea Level, etc.). It reviewed satellite data telecommunication systems that are currently being used for the collection of environmental data from remote areas, and discussed the role that they could play in the future Forum. The meeting noted that the future Forum is meant to provide guidance to the WMO and IOC users on the use of Satcom systems, including guiding them on how to make the best arrangements for the purchase of airtime. The Forum will provide detailed information on satellite systems capabilities so that users will be able to make informed decisions on what system to use. The meeting agreed that discussions will have to take place regarding the need for a centralized system (One-Stop Shop) for data processing, quality control, formatting of collected observations in WMO & IOC formats, and distribution to end users (e.g. GTS). The workshop acknowledged the value of the One-Stop Shop proposal, and agreed that this should eventually be a matter of discussion for the future Forum.

Regarding tariff negotiation issues, the workshop agreed that the current Argos Joint Tariff Agreement (JTA) should eventually operate as an independent sub-group of the future Forum.

The workshop reviewed the draft Terms of Reference of the Satcom Forum as proposed by the WMO Commission for Basic Systems (CBS) Management Group. Based on discussions under previous agenda items, the workshop proposed some changes to the Terms of Reference of the Forum. These are reflected in Annex III.

The workshop discussed and drafted operating principles of the Satcom Forum, including governance, roles and responsibilities of the Satcom Forum Chair and Executive Committee, frequency of meetings, and reporting procedures.

The workshop reviewed, discussed, and updated the workplan leading to the formal establishment of the Forum by the co-sponsoring Organizations. This includes in particular the timing of and planning for the first ad hoc Forum workshop in 2013, including agenda, and invited participants. The workshop established an organizing committee for the [informal] ad hoc Satcom workshop to be held in 2013.

The workshop agreed that the draft Terms of Reference of the future Forum as proposed by this workshop should be presented to the forthcoming session of the CBS Implementation Coordination Team on Information Systems and Services (ICT-ISS) and the CBS Implementation/Coordination Team on Integrated Observing Systems (ICT-IOS) with the goal to submit them to the fifteenth Session of the CBS (CBS-XV) in September 2012. The workshop requested Mr Meldrum to liaise with the WMO Secretariat, and draft the required documentation according to the outcome of this workshop.

[Page left intentionally blank]

GENERAL SUMMARY

1. ORGANIZATION OF THE SESSION

1.1 Opening of the workshop

1.1.1 The Preparatory Workshop for the Establishment of an International Forum of Users of Satellite Data Telecommunication Systems (Satcom Forum) opened at 9.00 hours on Monday, 23 April 2012, at the International Conference Centre of Météo France in Toulouse, France.

1.1.2 The representative of the WMO Secretariat opened the meeting. He welcomed the participants and recalled the WMO Congress decision to initiate such as Forum in co-sponsorship with other international organizations such as the IOC
.

1.1.3 The meeting was chaired by Mr David Meldrum (United Kingdom).

1.1.4 The list of participants is provided in Annex II.

1.2 Adoption of the agenda

1.2.1 The workshop adopted the Agenda for the meeting, which is reproduced in Annex I.

1.3 Working arrangements

1.3.1 The Team agreed on its working hours and adopted a tentative time table for consideration of the various agenda items.

2. BACKGROUND INFORMATION AND RATIONALE FOR THE FORUM

2.1 The WMO Secretariat provided background information, and explained the rationale leading to the decision of the WMO Sixteenth Congress (Cg-XVI, Geneva, Switzerland, 16 May – 3 June 2011) to initiate the establishment of the Forum.

2.2 The Forum is meant to provide an international mechanism, covering the wide user base that exists within the co-sponsoring Organizations, to address remote data communication requirements – including tariff negotiations as needed – for automatic environment observing systems using satellite data telecommunication systems (Satcom systems).

2.3 The goal is to ensure appropriate coordination amongst users of Satcom systems in order to represent their collective interests with regard to Satcom systems requirements and tariffs. By sharing knowledge and ideas, the users can make informed decisions about the use of Satcom systems, influence the development of those systems to better address their requirements, and provide for a strong user base for negotiating with the Satcom service providers in order to support their observing systems in the most cost-effective way, and to maximize usefulness of these systems (e.g. data return, data timeliness, platform life-time).

2.4 The Forum's stakeholders will essentially include (i) representatives of co-sponsoring Organizations' Members/Member Nations/Member States; (ii) representatives of Users Groups; and (iii) representatives of the Secretariats of the co-sponsoring Organizations. Representatives of the Satcom systems operator and service providers, and the satellite equipment manufacturers shall also be invited to Forum sessions as observers.

2.5 Details on the rationale for establishing the Forum, and historical background are provided in Annex VI.

3. REVIEW OF EXISTING SATELLITE DATA TELECOMMUNICATION SYSTEMS, AND EVALUATION MECHANISMS TO BE PROPOSED WITHIN THE FORUM

3.0.0 Mr David Meldrum presented an overview of satellite data telecommunication systems that are currently being used for the collection of environmental data from remote areas. He stressed the following points:

- Many systems are being built or planned;
- Most will be fully commercial;
- Commercial success will determine survival;
- Very few systems include environmental data within their business plans;
- Environmental data users will have little influence over system operation or cost;
- Technical details concerning Satcom systems are difficult to find;
- Some systems recently launched have experienced severe financial difficulties.

3.0.1 The meeting noted that the future Forum is meant to provide guidance to the WMO and IOC users on the use of Satcom systems, including guiding them on how to get the best deal for the airtime. The Forum will provide detailed information on the satellite systems capabilities so that users will be able to make informed decisions on what system to use.

3.0.2 The meeting agreed that discussions will have to take place regarding the need for centralized system for data processing, quality control, formatting of collected observations in WMO & IOC formats, and distribution to end users (e.g. GTS).

3.1 Data Collection System (DCS) on Geostationary Meteorological Satellites

3.1.1 Mr Sean Burns (CGMS Secretariat, and EUMETSAT) provided an overview on the current status of Data Collection Services on Meteorological Satellites, focusing on geostationary satellites (see item 3.4 for the polar orbiting satellites part). The meeting noted that Data Collection Systems (DCS) are operated by the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), the National Oceanic and Atmospheric Administration (NOAA, USA), the Japan Meteorological Agency (JMA, Japan), the China Meteorological Administration (CMA, China), the Indian Space Research Organization (ISRO, India), and Roshydromet (Russia). The first three DCS above are coordinated by the Coordination Group for Meteorological Satellites (CGMS), and provide global coverage except for the polar regions.

3.1.2 Mr Burns provided technical information on DCS capabilities, including frequency bands, data flow, Data Collection Platform (DCP) types, data-rate (including high resolution DCP (HRDCP)), as well as on the EUMETSAT, NOAA, and JMA space segments and their evolution. The meeting noted that about 120 operators from 66 countries are currently using the EUMETSAT DCS, with about 1100 allocated regional DCPs, and 600 transmitting DCPs.

3.1.3 The meeting noted that DCS is currently being used for (i) collecting meteorological data from remote observing stations, (ii) water management (e.g. measurement of precipitation, river levels, river flow rates and water quality; including alert mode for flood warnings), (iii) tsunami monitoring (i.e. collecting data from tsunameter buoys).

3.1.4 The workshop noted that the WMO Congress initiative to establish the Forum was presented to the thirty-ninth Session of the Coordination Group on Meteorological Satellite (CGMS), which was held in Saint Petersburg from 3 to 7 October 2011. CGMS-39 supported the initiative, and requested EUMETSAT (as CGMS Secretariat) to represent CGMS in the preparatory workshop for the Forum. CGMS-39 also encouraged its members to participate in the Forum

3.2 Inmarsat

3.2.1 Mr Andy Fuller (IMSO) provided an overview on the International Mobile Satellite

Organization (IMSO). He recalled that IMSO, which has its headquarters in London, UK, was established by international Convention with 97 Member States with the core purposes to ensure the provision of maritime mobile satellite communications services for the Global Maritime Distress and Safety System (GMDSS), and to assume the functions and duties of the Co-ordinator of the Long-Range Identification and Tracking (LRIT). IMSO is not involved in commercial activities. Mr Fuller described the Inmarsat primary constellation, and reported on the data telecommunication capabilities via Inmarsat, including Inmarsat Mini C, Inmarsat D+, FleetBroadband (Inmarsat I-4), and Global Xpress.

3.2.2 Mr Fuller recognized the value of the future Forum to bring together the expectations of the users, and match them with the capabilities of the satellite operators.

3.3 Iridium

3.3.1 Mr Reece Pitts (Iridium, Inc.) provided an overview on the Iridium satellite telecommunication system.

3.3.2 Mr Pitts described the Iridium satellite system as a global communications provider of mobile voice and data services via 66 in-orbit satellites, serving 523,000 customers across the land-based handset, maritime, aviation, machine-to-machine (M2M) and government markets. He also provided an overview of current Iridium applications within the WMO and IOC frameworks.

3.4 Argos

3.4.1 Ms Fabienne Jacq (Collecte Localisation Satellites (CLS), France) provided an overview of the Argos data collection and location system.

3.4.2 She described the Argos system as a government-based service where space capability is owned and shared by agencies, satellite control facilities are government responsibility, and service is operated by an agent (CLS). Argos is a system designed and dedicated to science.

3.4.3 Ms Jacq outlined the expectations of Argos with regard to the establishment of the future Forum, whereby Argos will benefit from years of improvement and exchange with the scientific community, and foster best practices in science, as well as in international centres such as JCOMMOPS. The Forum will stimulate the best use of Satcom services, and move from competitive airtime procurement to comparable and proven users services. It would promote the development of standard Service Level Agreements (SLA) commitments to fit with users' requirements and pre-existing practices (operational commitment, performance reporting, quality control, best delivery practices). The Forum will provide a strategy compatible with both governmental and commercial constraints.

3.4.2 The workshop also regarded the Argos Joint Tariff Agreement (JTA) as an existing mechanism dedicated to a particular Satcom systems that could well be used as a model for developing the Forum.

3.5 Orbcomm

3.5.1 Mr Christian Allred (Orbcomm Inc.) provided an overview on the Orbcomm satellite data telecommunication system.

3.5.2 Mr Allred described the Orbcomm system as a leading satellite network provider for low-cost, two-way, data communications, with Machine-to-Machine (M2M) communications focus, for tracking, monitoring and controlling mobile and fixed assets. User benefits include low operational cost, enhanced security, increased efficiency, and asset protection. He also described how Orbcomm is currently being used for WMO and IOC applications.

3.6 Globalstar

3.6.1 Mr Vlada Krasojevic (Globalstar) provided an overview of the Globalstar satellite telecommunication system. He described Globalstar as a large provider of Mobile Satellite Services Worldwide with over 500,000 subscribers in 120 countries, and 42 satellites currently orbiting earth. He also described how Globalstar is currently being used for WMO and IOC applications.

3.7 Other systems

3.7.1 The workshop also reviewed other satellite telecommunication systems that could potentially be used for the collection of observational environmental data from remote platforms.

4. USER REQUIREMENTS

4.1 WMO requirements

4.1.1 Requirements for remote AWS

4.1.1.2 The workshop reviewed the WMO user requirements for the collection of meteorological data from AWS deployed in remote areas.

4.1.1.3 Noting that weather data are important for many purposes: synoptic, disaster/warnings, climate, public, forecasting, the members of the CBS Expert Team on Requirements and Implementation of Automatic Weather Stations (ET-AWS) had highlighted difficulties in obtaining data communications from remote AWSs where there are few people and little or no infrastructure. There are significant data gaps in Africa, South America, and the Pacific region. Many countries (e.g. Australia, Canada, Morocco) have large areas where satellite communications is the only option.

4.1.1.4 AWS platform types include

(i) Synoptic AWS (regular frequency hourly or half-hourly, timeliness <30 minutes, 5-10k bits message size, two-way communications),
(ii) Real-time AWS (regular frequency <=10 min, IP type communications, 5-10k bits message size, no delay),
(iii) Event based station (Rainfall, river height; heartbeat 3-hourly or daily when no event e.g. rain, report each increment e.g. rainfall or river height, high frequency, low volume reports during rainfall event, real-time essential; no delay, very small message size <1k, one-way communications, and
(iv) Polar AWS.

4.1.1.5 Data communications include (i) satellite to satellite receiver, (ii) satellite to ground station; distribution via internet, (iii) satellite to ground station; distribution via GTS, (iv) one-way communications, (v) two-way communications (diagnostics and repair), and (vi) IP communications. The following considerations have to be taken into account for AWS networks:

- Data reporting options (frequency, volume, delay)
- Locations: tropics to poles, valleys (some systems don't work near poles)
- Nodes: purchase an aggregate (1k, 5k), e.g. if a large country were to buy 5000 nodes then nearby countries could benefit from their aggregate;
- Power supply limitations (solar, wind)
- Delivery points: in-country, ftp, GTS
- Formats – should WMO formats be used; or should the package be specified (i.e. beginning and end of message, but content flexible?)
- Low cost, multiple stations

4.1.1.6 The meeting noted the following challenges and opportunities

Challenges

- There are many different satellite data telecommunication systems, and it can be difficult to select the best one for each AWS
- Each domain/country has a reseller with different terms and prices (difficult when planning systems for another country, international organizations operate systems in many countries)
- There are several options for ground systems and antenna
- The cost for satellite communications compared to GPRS/3G can be an issue
- There are several different AWS requirements

Opportunities

If satellite data communications can provide low cost, flexible plans (volume charges), universal plans across countries, and ease of use and access, then the following quantities of AWS could potentially use Satcom systems: several hundreds of synoptic stations, more than 10 000 rainfall/river height stations, and several 10 000s of environmental observing stations.

4.1.1.7 in this context, the meeting agreed with the following key issues for the future Forum:

- Develop global products, applicable in countries, ocean, islands, poles.
- Develop standards for message delivery; formats; message container; time & location metadata, and discovery metadata.
- Develop data policy. Legal aspects regarding usage of data; beneficiaries of global WMO/IOC agreement.
- Security.

4.1.2 Requirements for polar observations

4.1.2.1 The workshop reviewed the user requirements for the collection of meteorological data from observing stations deployed in polar areas.

4.1.2.2 In WMO terms, the Polar Regions encompass not only the Arctic and Antarctic, but also the third pole of mountainous regions covered with snow and ice. These are remote areas, with little infrastructure and as such have specific demands for transmission of meteorological observations. Energy is frequently an issue, so transmissions need to be low power and short. Data speed (i.e. bandwidth in kb/s) is not an issue as the information being sent is low volume. However the transmission needs to be reliable, and the data need to be at a forecasting centre within 20 to 30 minutes of the observation being transmitted. In polar regions, using geostationary satellites can be a problem because of the satellites' low altitude or screening by terrain.

4.1.2.3 There are possibilities for using "retired", out-of-orbit geostationary satellites if their orbit brings them into view at certain times (e.g. South Pole). Argos and Iridium are frequently used, but some research AWS find the cost too high and opt for daily, weekly, monthly or annual downloads. It is important to have good fault finding schemes available as it is often difficult for the AWS operator to discover if problems lie with the AWS, the transmitter, the satellite, the ground station or the GTS. When data is collected at major staffed stations it is often possible to use e-mail or direct data transfer using links provided for business and social use.

4.1.2.4 There are several communities who may wish to use satellite communications. National meteorological services are obligated to provide meteorological measurements, and often have access to nationally negotiated rates. Research groups, often from universities, frequently collect meteorological data from remote locations, but may not require it in real time for their research. Some would be happy to provide it for forecasting, but not if there is a transmission cost attached to it. There is also a "Citizen Science" community, which could be persuaded to provide observations if this did not take much time and did not have a cost. As an example, most ships keeping watches record the pressure and winds at the change of watch, and many could send this information in a simple message.

4.1.3 Potential for developing cooperative mechanisms

4.1.3.1 The workshop discussed the potential for developing cooperative mechanisms concerning the Data Collection Systems (DCSs) of environmental satellites. The outcome of the discussion was taken into account when reviewing the operating principles of the future Forum.

4.1.4 Data processing and exchange

4.1.4.1 The workshop discussed ground data-processing issues, and the requirements for data exchange, including the use of reporting platform identification numbers, and the reporting of observational data to the WMO Information System (WIS) and the Global Telecommunication System (GTS), as well as related standards for data processing and quality control.

One-stop shop concept

4.1.4.2 The meeting heard a presentation from Mr Meldrum regarding the possible provision of an end-to-end Iridium service, that had been presented to the Data Buoy Co-operation Panel (DBCP) at its twenty-seventh session in Geneva in October 2011 (DBCP-27). The Panel was aware that, for many users, the costs of operating Iridium platforms were apparently much less than for Argos counterparts. However, Iridium did not offer an equivalent of the full Argos service, which included a number of value-added functions, including conversion of raw data to physical units, both real-time and delayed mode QC, GTS formatting and insertion, archiving, and open access to all parts of this chain by the JCOMMOPS Technical Coordinators (TCs). As a result, many operators had created their own 'back-office' services and took care of their own GTS insertion using their existing infrastructure.

4.1.4.3 Some members of the Panel attending DBCP-27 recalled that a similar situation had existed in the mid 1980s during the rollout of Argos drifter programmes. Whereas much of the GTS insertion at that time had been undertaken by the two main Argos processing centres, many regional HRPT stations also generated GTS bulletins, often of poor quality. As a result, drifter observations as a whole attracted a negative reputation. This had led directly to the creation of the DBCP and the appointment of its first TC in 1987. The solution had been to persuade regional HRPT antenna operators to feed their near-real-time data to the Argos processing centres, where they received a consistent level of processing in terms of data conversion, QC, formatting and GTS insertion. Additionally, and most importantly, the DBCP TC had access to all nodes of the processing chain and was able to initiate prompt action in the event of a problem being noted with a particular platform or processing module.

4.1.4.4 In order to circumvent possible similar issues with the uncoordinated GTS insertion of Iridium data from a wide range of platforms, including ships and floats, DBCP-27 considered a proposal from Mr Meldrum to establish an Iridium '1-Stop Shop' (1SS) that would be modelled closely on the current arrangements for Argos. Additionally it might generate income for JCOMMOPS through revenue-sharing with the eventual 1SS service provider.

4.1.4.5 While DBCP-27 recognized the considerable value that could accrue from such a service, it noted that a number of difficulties potentially impeded its acceptance. From an operator point of view, many agencies had already established their own Iridium infrastructure. The costs of this were generally 'invisible' to platform operator, whereas a 1SS would be visibly more expensive. Additionally, and critically, there had been no major crises so far with Iridium data circulating on the GTS, which meant that there was little incentive to change the present arrangements. Furthermore, the 1SS service provider would face a very difficult business case, in that there would be large up-front costs to build service, with no guarantee of market buy-in, and little margin from Iridium air-time sales.

4.1.4.6 DBCP-27 felt that it would in consequence be necessary to attract significant community buy-in as a precondition to proceeding to an Invitation to Tender (ITT) for 1SS services, and it urged Mr Meldrum and CLS to develop a short position paper and draft business case to address this issue and seek community approval. This action was still under way. The Panel also noted that a successful

outcome might in due course lead to similar arrangements in support of environmental monitoring using other satellite communication systems.

4.1.4.6 The workshop acknowledged the value of the 1SS proposal, and agreed that this should eventually be a matter of discussion of the future Forum.

4.2 IOC requirements

4.2.0 The workshop reviewed user requirements for the collection of marine meteorological and oceanographic data from observing platforms deployed in the global oceans. These systems are operated as part of the IOC-WMO-UNEP-ICSU Global Ocean Observing System (GOOS), which is led by the Intergovernmental Oceanographic Commission (IOC) of UNESCO. The implementation of such systems is overseen internationally by the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

4.2.1 Buoys

4.2.1.1 The workshop reviewed the requirements for the collection of observations from data buoys, including drifters and moored buoys. Most drifting buoys currently use Argos, although there is a steadily increasing move towards Iridium. Moored data buoys use a wider range of satellite data telecommunication options. The meeting agreed that requirements for observing tropical cyclones should be explicitly covered as well, given that there are moored and drifting data buoys deployed for that purpose.

4.2.2 Ship-based observations

4.2.2.1 Mr Pierre Blouch, Chairman of the SOT Task Team on Satellite Communications, presented the requirements for Voluntary Observing Ships (VOS), as well as an outline of the current use of Satcom systems. Strong constraints include global coverage, good timeliness and availability, location at the time of the observation and optimized costs. There were no real constraints with regard to data volume (messages are generally shorter than 100 bytes), power supply or space.

4.2.2.2 Although the requirements are globally the same for conventional VOS as for Shipborne Automated Weather Stations (S-AWS), current uses are different. Most of the conventional VOS are using the Inmarsat-C GMDSS terminal, mandatory on all ships over a certain tonnage. Even through this system, several practices exist, such as Short Access Code 41 and compression techniques developed in Europe (E-SURFMAR data format) and in the US (SEAS). Some conventional VOS are also using emails when the ship has an Internet connection and voice, (VHF, GSM) in coastal areas.

4.2.2.3 S-AWS stations use several different systems including Argos, DCP, Inmarsat-C Data and Iridium SBD. Emails are also used, but it should be noted that the trend is towards increased usage of Iridium SBD.

4.2.3 Sea level observations

4.2.3.1 The workshop reviewed the requirements for the collection of observations from sea level stations, including tsunameters and tide gauges. The workshop noted that efforts are being made to upgrade tide gauges from delayed mode to real-time reporting (e.g. for tsunami verification).

4.2.4 Argo and other profilers

4.2.4.1 The workshop reviewed the requirements for the collection of observations from profiling floats, and other types of profiling instruments. As for drifting buoys, most Argo floats currently use Argos, although Iridium is increasingly being used. The workshop noted the legal issues with regard to floats entering the Exclusive Economic Zones of Members/Member States, and agreed that the 1 Stop Shop concept could provide a solution for monitoring these floats from a global perspective.

4.2.5 Other

4.2.5.1 The workshop reviewed the requirements for the collection of observations from other types of platforms (e.g. bio-geochemical).

4.2.5.2 The workshop agreed that the future Forum would be an opportunity to review and evaluate all Satcom systems usable for WMO and IOC applications. The workshop also recognized the need for guaranteed tariffs in order for the users to be able to invest in the appropriate Satcom technology.

4.3 Food and Agriculture Organization (FAO) requirements

4.3.1 There was no representative of the Food and Agriculture Organization (FAO) at the workshop to report on FAO requirements.

4.4. Radio frequency issues in relation to data collection

4.4.1 Mr David Thomas (WMO Secretariat) provided an overview of the radio-frequency issues in relation to data collection using satellite systems. This was essentially based on an extract from the WMO/International Telecommunications Union (ITU) Handbook[1] on the "Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction". It described that, from a radio frequency management perspective, satellite data collection systems (DCS) come under the Earth to space communications component of meteorological satellite services (MetSat) which is under the Earth Exploration Satellite Service (EESS). The Handbook highlighted that the frequency 401-403MHz (Metsat "Earth to space") allocated to this service and used by most DCS has some potential conflict with those allocated to meteorological aids (MetAids – 401 to 406 MHz), in particular those utilized for radiosondes, and noted a requirement for coordination between users of these bands.

4.4.2 The workshop noted that new generation DCS that interrogate data platforms are utilizing the Metsat space to Earth frequencies (460-470MHz) and that some DCS also utilize the Metsat Earth to space frequencies (148 MHz) for uplink and space to Earth frequencies (137MHz) for interrogating observing platforms. Also noted was the choice of frequency bands for collections systems included consideration of data rates and volumes, power performance, antenna size and that the allocation of radio spectrum for MetSat services was the responsibility of the ITU. WMO's Commission for Basic Systems (CBS) contributes to this process through the work of the CBS Steering Group on Radio Frequency Coordination (SG-RFC). The long term sustainability of DCS and their cost efficiency relies heavily on the work of the SG-RFC, both in the ITU allocation process and in the coordination between users. The workshop recognized the SG-RFC also works closely with informal voluntary collaborative groups such as the Space Frequency Coordination Group (SFCG), which coordinates usage of the allocated frequencies between satellite operators.

4.5 Creation of a dialogue between the user community and satellite operators

4.5.1 The workshop discussed mechanisms that could be proposed as part of the Satcom Forum for creating a dialogue between the user community and satellite operators, and thereby relaying user requirements to them. These have been considered as part of the drafting of the operating principles for the future Forum.

4.5.2 The workshop noted that there are two types of communities to consider in the future Forum, i.e. (i) those who need added value service (e.g. real-time data quality control, GTS formatting, and distribution), and (ii) those who only require basic data collection service. The workshop agreed that the 1 stop shop concept could provide opportunities regarding added value services, and invited interested parties to tender in due course.

4.5.3 The workshop noted the following benefits of the future Forum to Satcom service providers:

1 Handbook on Radio Frequency http://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-45-2008&media=electronic

- Visibility, image
- Responding to the needs of the WMO and IOC communities
- Exposure to new users
- Understanding the user needs thanks to the sharing of requirements, and information on Satcom systems use
- WMO and IOC user community approaching the industry as one

4.6 Creation of a dialogue between the user community and satellite equipment manufacturers

4.6.1 The workshop discussed mechanisms that could be proposed as part of the Satcom Forum for creating a dialogue between the user community and satellite equipment manufacturers, and thereby for relaying user requirements to them.

4.6.2 The workshop noted that, about twenty years ago, most global satellite telemetry systems were owned/operated by governments, or pseudo-governmental organizations. These were systems where environmental data telemetry users wielded significant influence in their design and operation. Today's situation was quite different. Most satellite data telemetry traffic now occurs on commercial systems and environmental users have far less influence. These new larger satellite operators are welcome as they add to the available data telemetry options, but they also add complexity and confusion to the work of environmental data telemetry users. Mr Andy Sybrandy (Pacific Gyre) provided the following perspective of a commercial equipment manufacturer and system integrators on the international Satcom Forum. He made five different recommendations:

1. Achieving better standardization regarding message (and command) formats; sensors (recommendations, accuracies); and sampling (e.g. frequency, averaging, ranges, resolution)
2. Promoting Pilot projects – Equipment manufacturers and users want useful, cost effective and reliable instrumentation. In order to continually optimize all three of these utilities, it is often necessary to adopt new methods and technologies. Pilot projects are a safe way for both users and manufacturers to investigate these technologies.
3. Portals and Reference Documents - The Satcom Forum could provide a portal for users to access manufacturer websites, satellite coverage maps and outage notifications, upcoming Satcom and related organization meetings. The web site may also provide a library of white papers, helping users understand
4. Matrix of Systems and Matrix of Users - Matrices can be constructed which present useful information from the perspective of either the satellite operators or the users. The first table lists requirements of various user groups or applications. Another table may list the specifications of a list of satellite operators. Tables should include links to included criteria explaining their inclusion. Appendix A describes a list of criteria that may be included.
5. Certification of Value Added Resellers and GTS Insertion - While it may not be possible to negotiate tariffs directly with the satellite operators. It may be possible to negotiate with a number of their value added resellers. These agreements would result in a list of approved airtime providers. This list would help new users to enter into the system and receive competitive pricing. The pricing could be published on the Satcom site. These resellers would then naturally become the default providers of value-added services, including insertion of data into WIS/GTS, which may be enticing enough to draw resellers into the program.

6.6.3 A key function of the Satcom Forum should be to help users understand and make informed choices from amongst the diverse range of systems now available.
6.6.4 Annex VIII provides a list of criteria which may be described in tables published by the Satcom Forum describing the specifications of satellite operators or requirements of users.

5. TARIFF ISSUES

5.1 Pricing of data telecommunication services

5.1.1 The workshop reviewed the existing pricing systems of relevant satellite data collection systems, noting that most commercial systems were operating through networks of Value Added Resellers (VAR).

5.2 Specific tariff negotiating schemes that might be managed through the Forum

5.2.1 The workshop discussed how tariff negotiations with the relevant satellite data telecommunication systems operators might be managed through the Satcom Forum as a joint activity between the different user groups. The workshop agreed that for the time being, only Argos and its existing Joint Tariff Agreement (JTA) should be considered by the Forum.

5.3 The Argos Joint Tariff Agreement model

5.3.1 Mr Frank Grooters (Netherlands), Chairman of the Argos Joint Tariff Agreement (JTA) reported on the JTA model, and elaborated on the role that the JTA could play within the Satcom Forum. The JTA provides a platform for the various (semi-)governmental user communities to discuss and negotiate with the agent (i.e. CLS) which operating costs and investments are to be made for maintaining the required level of the Argos service and how the related costs have to be shared among the different communities of beneficiaries (oceanography, wildlife, meteorology, other). This process is directed by well-defined and generally agreed user requirements and based upon the amortization of the operational costs specifically allotted to this type of usage. Negotiations are conducted to reduce financial contribution of users while maintaining a significant level of SLA commitment on the quality of the service by the agent, and keeping margin for risks in case the programme would suffer from difficulties that cannot be avoided (i.e. existing DBCP issues with drifter mortalities). This approach has for many decades been central to the success of the JTA, and has resulted in an expansion of global benefits to a wide range of users (i.e. JTA members), with the support of the WMO and IOC.

5.3.2 The workshop noted that the negotiations are a collegiate process, in which the agent is sharing sensitive financial information with the JTA members. On behalf of its members, the JTA is co-funding new developments as the result of amended user requirements on request of the members. The investments made jointly have proven to be beneficial to the JTA members (i.e. users).

5.3.3 The workshop agreed that if the JTA should become a sub-group in the future Forum, it is essential that this type of negotiation (related to the Argos SLA, user requirements implementation and cost sharing mechanism) remain the domain of an independently operating JTA dedicated to the Argos system, still shared with the Argos Operations Committee (OPSCOM). Differences among service providers, in management, pricing principles, legal status and service provision, may complicate the centralization of pricing management. A role for the Forum regarding pricing and tariffs could however better be seen in an administrative fashion. It should nevertheless be recorded that the Argos tariff structure is based on a cost recovery mechanism following public governing principles and has to remain considered as such in case of a general central tariff administration.

5.3.4 The workshop also noted that the JTA has a long-standing record in defining user requirements and requesting user oriented end-to-end service at an affordable and mutual (user and service provider) agreed level. The JTA is ready to share its user oriented expertise under the umbrella of such an International Forum. Exchange of user requirements and data management aspects are crucial issues to the user for making a decision as to which service provider would offer the best service to his/her application. In the Forum all stakeholders should be present to make such a decision easier. The JTA is ready to contribute as much as appropriate to this process under the Forum management. However, in accordance with the directions of the Tariff MoU and the rules under the Global Agreement, details on tariff agreements, cost-sharing and other financial information will remain solely to be discussed and decided on at the JTA.

5.3.5 The workshop agreed that each of the potential satellite service providers will likely maintain its basic principles for setting price lists, negotiating tariffs and sharing sensitive technical information. That will not change once brought under an International Forum of Users of Satellite Data Telecommunication Systems. Current practice shows that financial agreements between users and (commercial) service providers are usually concluded on an individual basis. The JTA has shown that financial agreements can be concluded for an entire user community, based on requirements which are proposed by its users.

5.3.6 Mr Grooters explained that if the Forum is meant to be a “User Forum”, in which service providers are welcome to listen to the user and will make efforts to try and achieve arrangements to the benefit of both the service provider and the users, then the Forum should definitively be the “market” for the exchange of expertise on every issue relevant to the use of satellites for environmental data telecommunication. This is precisely the role the JTA is envisaging, and supporting, when talking about an International Forum of Users of Satellite Data Telecommunication Systems.

5.3.7 The workshop recognized that the JTA, together with the scientific programmes and the Argos agent, has gained long experience in delivering location and data collection services of high quality, committed through a SLA. Such quality (homogeneous between programmes, homogeneous in time and tuned to each scientific usage) has formed the basis for better science, operational oceanography and international cooperation over the world for more than 30 years. It would be beneficial that the Forum can expand such best practices to every new service provider addressing the scientific and operational user community for similar applications.

5.3.8 The workshop agreed that the JTA should eventually operate as an independent operating sub-group of the future Forum.

5.4 Other tariff issues

5.4.1 The workshop discussed other tariff issues. The workshop noted the following:

- Iridium works with service providers, which can organize themselves in “projects”. Pricing structures could be established from that perspective with one or more service provider, provided a business case is developed.
- Orbcomm and Globalstar have flexible tariff structures that can be adjusted to user needs.
- The provision of the airtime should be treated separately from the provision of the added value service (i.e. data processing to geo-physical units, automatic quality control, encoding into WMO and/or IOC format, distribution and GTS). JTA-like negotiations could be conducted for the value added services part, provided there is one stop shop for these services. The future Forum should be tasked to write technical specifications for the one stop shop (using raw data from various Satcom providers), and value added services, in order to prepare a call for tender.
- For the reasons noted in 4.1.4.3, there should be a single processing organization for the value added part.

6. ORGANIZATIONAL ISSUES

6.1 Draft Terms of Reference of the Forum

6.1.1 The workshop reviewed the draft Terms of Reference of the Satcom Forum as proposed by the WMO Commission for Basic Systems (CBS) Management Group. Based on discussions under previous agenda items, the workshop proposed some changes to the Terms of Reference of the Forum. These are reflected in Annex III.

6.2 Operating principles of the Forum

6.2.1 The workshop discussed and drafted operating principles of the Satcom Forum, including governance, roles and responsibilities of the Satcom Forum Chair, and Executive Committee, frequency of meetings, reporting procedures. The proposed operating principles are provided in Annex IV.

6.4 Workplan

6.4.1 The workshop reviewed, discussed, and updated the workplan leading to the formal establishment of the Forum by the co-sponsoring Organizations. This includes in particular timing and organizing plan for organizing the first *ad hoc* Forum workshop in late 2012 or 2013, including format, agenda, and invited participants.

6.4.2 The updated workplan is provided in Annex V.

6.4.3 The workshop established an organizing committee for the [informal] *ad hoc* Satcom workshop to be held in 2013. The Terms of Reference and membership of the organizing committee are provided in Annex VII.

7. RECOMMENDATIONS TO THE FORTHCOMING CBS-XV SESSION

7.1 The workshop agreed that the draft Terms of Reference of the future Forum as proposed by this workshop should be presented to the forthcoming session of the CBS Implementation Coordination Team on Information Systems and Services (ICT-ISS) and the CBS Implementation/Coordination Team on Integrated Observing Systems (ICT-IOS) with the goal to submit them to the fifteenth Session of the CBS (CBS-XV) in September 2012. The workshop requested Mr Meldrum to liaise with the WMO Secretariat, and draft the required documentation according to the outcome of this workshop (***action; D. Meldrum; 15 June 2012***).

8. ANY OTHER BUSINESS

8.1 There was no other business to discuss at this point.

9. CLOSURE OF THE SESSION

9.2 In closing the session, the Chairperson, Mr David Meldrum thanked Météo France for the excellent facilities, support and hospitality that had been provided for the meeting. He also thanked the participants and the Secretariat for their valuable contributions during the workshop discussions.

9.2 The workshop closed at 1700 on Tuesday 24 April 2012.

ANNEX I

AGENDA OF THE WORKSHOP

1. ORGANIZATION OF THE SESSION

1.1 Opening of the workshop
1.2 Adoption of the agenda
1.3 Working arrangements

2. BACKGROUND INFORMATION AND RATIONALE FOR THE FORUM

3. REVIEW OF EXISTING SATELLITE DATA TELECOMMUNICATION SYSTEMS, AND EVALUATION MECHANISMS TO BE PROPOSED WITHIN THE FORUM

3.1 Data Collection System (DCS) on Geostationary Meteorological Satellites
3.2 Inmarsat
3.3 Iridium
3.4 Argos
3.5 Orbcomm
3.6 Globalstar
3.7 Other systems

4. USERS REQUIREMENTS:

4.1 WMO requirements

- 4.1.1 Requirements for remote AWS
- 4.1.2 Requirements for polar observations
- 4.1.3 Potential for developing cooperative mechanisms
- 4.1.4 Data processing and exchange

4.2 IOC requirements

- 4.2.1 Buoys
- 4.2.2 Ship-based observations
- 4.2.3 Sea level observations
- 4.2.4 Argo and other profilers
- 4.2.5 Other

4.3 FAO requirements

4.4. Radio frequency issues in relation to data collection

4.5 Creation of a dialogue between the user community and satellite operators

4.6 Creation of a dialogue between the user community and satellite equipment manufacturers

5. TARIFF ISSUES

5.1 Pricing of data telecommunication services
5.2 Specific tariff negotiating schemes that might be managed through the Forum
5.3 The Argos Joint Tariff Agreement model
5.4 Other tariff issues

6. ORGANIZATIONAL ISSUES

6.1 Draft Terms of Reference of the Forum
6.2 Operating principles of the Forum
6.4 Workplan

7. RECOMMENDATIONS TO THE FORTHCOMING CBS-XV SESSION

8. ANY OTHER BUSINESS

9. CLOSURE OF THE SESSION

ANNEX II

LIST OF PARTICIPANTS

1. WMO COMMISSION FOR BASIC SYSTEMS (CBS)

IMPLEMENTATION/COORDINATION TEAM ON INFORMATION SYSTEMS AND SERVICES (ICT/ISS)

Mr David THOMAS
Chief, Information and Telecommunication System Division
WMO Information System Branch
Observing and Information Systems Department
World Meteorological Organization
7 bis, avenue de la Paix
Case Postale No. 2300
CH-1211 Geneva 2
Switzerland
Tel: +41 22 730-8241
Fax: +41 22 730-8021
E-mail: dthomas@wmo.int

2. JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)

Ship Observations Team (SOT)

Mr Pierre BLOUCH
Chair, SOT Task Team on Satellite Telecommunication Systems
E-SURFMAR Programme Manager
Météo France
Centre de météorologie marine
13 rue du Chatellier
CS 12804
29228 Brest cedex 2
France
Tel: +33 2 98 22 18 52
Fax: +33 2 98 22 18 49
Email: pierre.blouch@meteo.fr

Data Buoy Cooperation Panel (DBCP)

Mrs Kelly STROKER
Technical Coordinator, DBCP & OceanSITES
JCOMMOPS
8-10 rue Hermès
Parc Technologique du Canal
31520 Ramonville St Agne
France
Tel: +33 5 61 39 47 82
Fax: +33 5 61 75 10 14
Email: kstroker@jcommops.org

Dr Luca CENTURIONI
Global Drifter Program (GDP)
University of California, San Diego
Scripps Institution of Oceanography
9500 Gilman Drive

La Jolla CA 92093-0213
United States
Tel: +1 858 534 6182
Email: lcenturioni@ucsd.edu

JCOMM *in situ* Observations Programme Support Centre (JCOMMOPS)

Mr Mathieu BELBEOCH
Argo/SOT Technical Coordinator, Argo Information Centre
JCOMMOPS
8-10 rue Hermès
Parc Technologique du Canal
31520 Ramonville St Agne
France
Tel: +33 5 61 39 47 30
Fax: +33 5 61 75 10 14
Email: belbeoch@jcommops.org

3. WMO EXECUTIVE COUNCIL PANEL OF EXPERTS ON POLAR OBSERVATIONS, RESEARCH AND SERVICES (EC-PORS)

Mr Jon D. SHANKLIN (via teleconference)
Head, Meteorology and Ozone Monitoring Unit
British Antarctic Survey
High Cross, Madingley Road
Cambridge, CB3 OET
United Kingdom
Tel.: +(44 1223) 251 482
Fax: +(44 1223) 221 279
E-mail: j.shanklin@bas.ac.uk

Mr Johan STANDER
Regional Manager
South African Weather Service, Head Office
P O Box 21
Cape Town International Airport
Cape Town 7525
South Africa
Tel: +27 (0) 21 934 0450
Fax: +27 (0) 21 934 3296
Email: johan.stander@weathersa.co.za

4. COORDINATION GROUP ON METEOROLOGICAL SATELLITES (CGMS) SECRETARIAT

Mr Sean BURNS
Secretariat, CGMS
European Organization for the Exploitation of Meteorological Satellites
Eumetsat-Allee 1
D-64295 Darmstadt
Germany
E-mail: Sean.Burns@eumetsat.int

5. MEMBERS/MEMBER NATIONS/MEMBER STATES

United States of America

Mr Eric LOCKLEAR
National Oceanic and Atmospheric Administration
Climate Progrm Office
1315 East-West Highway,
Room 12107, SSMC 3
Silver Spring MD 20910-5603
United States
Tel: +1 301 734 1236
Fax: +1 301 713 0518
E-mail: eric.locklear@noaa.gov

6. SATELLITE DATA TELECOMMUNICATION SYSTEMS

Iridium

Mr Reece PITTS
Account Manager
Iridium Communications, inc
EMEA & Russia Office Thremhall House
Thremhall Park, Start Hill, Bishop's Stortford
Herts CM22 7WE
United Kingdom
Tel: +44.1279.874.455
E-mail: Reece.Pitts@iridium.com

International Mobile Satellite Organization (IMSO)

Andy FULLER
Deputy Director General
International Mobile Satellite Organization
99 City Road, London EC1Y 1AX, UK
Tel: + 44 (0) 207 728 1378
Fax: + 44 (0) 207 728 1172
E-mail: andy_fuller@imso.org
Web: www.imso.org

Argos

Mr Frank GROOTERS
Chair, Argos Joint Tariff Agreement (JTA)
Prunuslaan 17
NL-3732 WC Bilthoven
The Netherlands
Tel: +31 30 229 32 50
Fax: +31 6 11 225 867
E-mail: fgrooters@gmail.com

Ms Fabienne JACQ
Director, CLS Data Collection & Location Dept
Collecte Localisation Satellites
Parc Technologique du Canal
8-10, rue Hermès,
31520 Ramonville Saint-Agne

France
Tel: +33 5 61 39 47 64
Fax: +33 5 61 39 47 97
Email: fjacq@cls.fr

Mr William WOODWARD
President, CLS America
CLS America
4300 Forbes Blvd, Suite 110
LANHAM, MD 20706
United States
Tel: +1 240 492 1901
Fax: +1 301 925 8995
Email: bwoodward@clsamerica.com

Globalstar

Mr Vlada KRASOJEVIC
Regional Sales Manager – Europe
Globalstar Europe Satellite Services, Ltd.
Unit 10, The Hyde Building
The Park
Carrickmines
Dublin 18
Ireland
Mobile: +39 32 71410324
Fax : +353 1 2909567
E-mail: Vlada.Krasojevic@globalstar.com

Orbcomm

Mr Anthony HOPKO
Chief Engineer, Space Segment
ORBCOMM Inc.
22265 Pacific Blvd., Suite 200
Dulles, VA 20166, USA
Tel: 703.433.6300 / 703.433.6422 (Dir)
Fax: 703.433.6380
E-mail: thopko@orbcomm.com

Mrs Mariuxi CHAVEZ
Business Development, Director
Orbcomm INC.
Madrid
Spain
Tel. +3491.2422749
Cel. +34.650455773
Email: chavez.mariuxi@orbcomm.com

7. MANUFACTURERS

Mr Andy SYBRANDY, President
Pacific Gyre Inc.
3740 Oceanic Way, Suite 302
Oceanside, CA 92056
USA
Tel: +1-760-433-6300

Email: asybrandy@pacificgyre.com
Web: www.pacificgyre.com

Mr Wolfgang MARXER
Chief, Engineer
SEBA Hydrometrie GmbH & Co. KG
Gewerbestr. 61A
87600 Kaufbeuren
GERMANY
Tel: +49 (0) 8341 964860
Fax.: +49 (0) 8341 964848
E-mail: Marxer@seba.de

Mr Jorma ISLANDER
Product Manager
Surface Sensing
Vaisala Products and Technology
Vaisala Oyj
P.O.Box 26
FIN-00421
FINLAND
Tel: +358 9 894 92337
Mobile: +358 40 722 4656
Fax: +358 9 894 92564
Email: jorma.islander@vaisala.com

Mr Philip BARLETT
FTS Chief Technology Officer
FTS Forest Technology
1065 Henry Eng Place
Victoria, BC CANADA
V9B 6B2
Tel: 1.800.548.4264
Fax: 250.220.6006
E-mail: pbartlett@ftsinc.com
Web: http://www.ftsinc.com

8. WORLD METEOROLOGICAL ORGANIZATION (WMO)

Mr Jerome LAFEUILLE
Chief, Space-based Observing System Division
Space Programme Office
Observing and Information Systems Department
World Meteorological Organization
7 bis, avenue de la Paix
Case Postale No. 2300
CH-1211 Geneva 2
Switzerland
Tel.: (+41 22) 730 8228
Fax: (+41 22) 730 8021
E-mail: jlafeuille@wmo.int

Mr David THOMAS
Chief, Information and Telecommunication Systems Division
WMO Information System Branch
Observing and Information Systems Department
World Meteorological Organization

7 bis, avenue de la Paix
Case Postale No. 2300
CH-1211 Geneva 2
Switzerland
Tel: +41 22 730-8241
Fax: +41 22 730-8021
E-mail: dthomas@wmo.int

Mr Etienne CHARPENTIER
Observing Systems Division
Observing and Information Systems Department
World Meteorological Organization
7 bis, avenue de la Paix
Case Postale No. 2300
CH-1211 Geneva 2
Switzerland
Tel.: (+41 22) 730 8223
Fax: (+41 22) 730 8021
E-mail: ECharpentier@wmo.int

8. INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC) OF UNESCO

Mr David MELDRUM
Consultant, Ocean Observation and Services
Intergovermental Oceanographic Commission of UNESCO
UNESCO
1 rue Miollis
75015 Paris
France
Tel: +33 1 45 68 39 88
Email: d.meldrum@unesco.org

Dr Thomas GROSS
Ocean Observations and Services Section
GOOS Project Office
Intergovernmental Oceanographic Commission of UNESCO
IOC/UNESCO
1 rue Miollis
75732 Paris cedex 15
France
Tel: +33 1 45 68 39 92
Fax: +33 1 45 68 58 12
E-mail: t.gross@unesco.org

9. OBSERVERS

Mr Philipp B. LENHARDT
Untergammenried 6
86825 Bad Wörishofen
Germany
Tel.: +49 (0) 8247 / 8300
Mobil: +49 (0) 170 / 9042161
Email: pl@lenhardt-online.de

ANNEX III

DRAFT TERMS OF REFERENCE FOR AN WMO-IOC INTERNATIONAL FORUM OF USERS OF SATELLITE DATA TELECOMMUNICATION SYSTEMS

The International Forum of users of satellite data telecommunication systems is an entirely self-funded body jointly sponsored by the World Meteorological Organization (WMO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO, of the United Nations in the view to address the requirements of these two Organizations for the timely collection of environment data from observing platforms.

Main goals

- It ensures proper coordination amongst the users of satellite data telecommunication systems and represents their collective interests in working with the satellite telecommunication service providers in order to advance the awareness and understanding of user requirements
- to advance the awareness and understanding of available and planned capabilities
- to facilitate adoption of interoperability and quality standards and principles
- to provide guidance to best meet user needs of each considered application.

Activities

The Forum shall:

1. Review available technologies, share experiences, and address the following requirements in the view to document capabilities, and identify strengths and weaknesses of the different satellite data telecommunication systems to address the requirements of specific uses.

    - Global and regional coverage; specifically polar regions and third pole
    - Network services and data access technology;
    - Data transmitter technology, including radio-frequencies, interface programming, and electric power consumption;
    - Data transmission rates;
    - Data transmission quality;
    - Real-time capability and data timeliness;
    - Location capability;
    - One-way vs. two-way data communication;
    - Ground segment data processing, quality control, and distribution requirements;
    - Data collection, and ground segment data processing pricing;
    - Etc.
    - Reliability
    - Future developments / maintaining current system
    - Size
    - Bandwidth

    - Recommend certain providers for certain requirements?

2. If appropriate, propose common approaches for specific user needs, and identify the best and more cost-effective satellite data telecommunication systems options to be used for the relevant observing platforms;

3. Make proposals for establishing cooperative mechanisms through the Data Collection Platform (DCP) services of meteorological satellites;

4. Facilitate negotiations between users and the satellite data telecommunication system operators

for

- Inclusion of specific user requirements in their respective development programmes;
- Continuity of cost-effective data telecommunication services by encouraging tariff negotiating schemes such as the existing Argos Joint Tariff Agreement (JTA).

5. Facilitate negotiations with the manufacturers of platform transmitters for the inclusion of specific user requirements in future models of the transmitters;

6. Review and agree on its operating principles. The operating principles define the aims and principles of the Forum; the roles and responsibilities of the stakeholders and the Secretariats of the co-sponsors; the Terms of Reference of the Executive Committee; the structure and frequency of meetings; and their desired outcome; as well as the reporting procedure of the Forum;

7. Elect a Chairperson, and vice-Chairperson from its participants;

8. Elect an Executive Committee, chaired by the Forum's Chairperson, and including the vice-Chairperson, and stakeholder representatives; Amount of users/service providers?

9. Report through the Chairperson to the Executive Bodies of the Co-Sponsor Organizations, and submit its recommendations as appropriate for their agreement;

Decisions shall be agreed unanimously by the Forum. If decisions cannot be agreed unanimously, they will be deferred to the Executive Committee for further discussion and decision.

Membership:

Membership is open to all representatives of the co-sponsors stakeholders. Invitations to participate in the Forum are issued by the Secretariats of the co-sponsors to their respective Members/Member States, as well as to their relevant programmes and bodies. Representatives of the satellite data telecommunication providers, and the platform transmitter manufacturers can participate in the Forum as observers. Representatives of the Secretariats of the co-sponsors participate as ex-officio members of the Forum.

These Terms of Reference are agreed upon by the Executive Bodies of the Co-sponsors.

_____

ANNEX IV

DRAFT OPERATING PRINCIPLES OF THE WMO-IOC INTERNATIONAL FORUM OF USERS OF SATELLITE DATA TELECOMMUNICATION SYSTEMS (FORUM)

Table of contents

1. Introduction

The WMO-IOC International Forum of Users of Satellite Data Telecommunication Systems (Forum) provides for an international mechanism covering a wide user basis from the co-sponsoring Organizations, to address remote data communication requirements – including tariff negotiations as needed – for automatic environment observing systems using satellite data telecommunication systems (Satcom systems).

The goal of the Forum is to ensure appropriate coordination amongst users of Satcom systems in order to represent their collective interests with regard to Satcom systems requirements, and tariffs. By sharing knowledge and ideas, the users can make informed decisions about the use of Satcom systems, influence on the developments of those systems to better address their requirements, and provide for a strong user base for negotiating with the Satcom service providers in order to their observing systems in the most cost-effective way, and maximize usefulness of these systems (e.g. data return, data timeliness, platform life-time).

Forum's stakeholders include: Amount of representatives needs to be defined

i. Representatives of co-sponsoring Organizations Members/Member States (ROMs);
ii. Representatives of Users Groups (FRUGs);
iii. Representatives of the Secretariats of the co-sponsoring Organizations;
iv. Representatives of the Satcom systems operator and service providers(*ex officio*).);
v. Representatives of the satellite equipment manufacturers (Observers).

2. Basic aims and principles of the Forum

2.1 The basic aims and principles are as follows:

i. The benefits of Forum participation should be shared equally amongst all participants (Users);
ii. The information validated by the Forum (e.g. user requirements, performances of Satcom systems, recommendations) should be shared within the Forum and with the wider community of the co-sponsoring Organizations on a free and unrestricted basis;
iii. The Forum may wish to initiate and establish sub-programmes of the Forum to address the particular requirements and needs of a specific Satcom system or user group. Sub-programmes of the Forum should following the general principles below:

1. The sub-programme shall follow the aims and principles of the Forum;
2. The sub-programme shall define the scope of its activities;
3. The sub-programme shall propose its Terms of Reference, and Operating Principles to be approved by the Forum.

2.2 The Argos Joint Tariff Agreement (JTA) is established as a sub-programme of the Forum on the basis of the Terms of Reference and Operating Principles of the JTA agreed upon at the 32nd Session of the JTA. Its scope is to address requirements for using the Argos system, and to provide a mechanism for negotiating Argos Tariff amongst Argos governmental users.

2.3 The Terms of Reference of the Forum are given in Annex A.

3. The stakeholders' representation

3.1 Representatives of the co-sponsoring Organizations Members/Member States (ROMs)

ROMs are representing the Satcom users of a Member or Member State of the co-sponsoring Organizations. The Terms of Reference of the ROMs, including mechanism for their nomination are provided in Annex B.

3.2 Representative of a User Group (FRUG)

3.2.1 A Representative of a User Group (FRUG) is an individual who can fairly represent the overall consensus view of a significant user community regarding the use of Satcom systems. Such communities might reasonably include the operators of specific environmental observing stations, e.g. Automatic Weather Stations (AWS), polar observing stations, data buoys, floats, ice platforms, animal tags, ship stations and airborne stations, or bodies with agreed international responsibilities for the promotion, sponsorship or validation of any aspect of environmental observation using Satcom systems (e.g. IOC, WMO, FAO, WWF). The FRUG will work with Satcom system providers and the Forum Executive Committee to identify opportunities that might bring the Forum session into closer contact with his/her user group, with a view to establishing within that group the benefits of the Forum process.

3.2.2 The Terms of Reference of a Forum Representative of a User Group (FRUG), including mechanism for their nomination are provided in Annex C.

3.3 Satcom system providers

3.3.1 The Satcom system providers are the agents operating the Satcom systems ground segments, or Value Added Reseller (VAR) for such systems. They normally promote the use of the satellite systems they are responsible of. Those services are usually provided at a cost to the users. Their representatives are observers in the Forum.

3.3.2 The role of the Satcom system providers with regard to the Forum is:

i. to report to the Forum on developments and operations, related to the use and performances of their respective Satcom systems;
ii. to report to the Forum on their pricing policy and structure (unless confidential information);
iii. to collect requirements from the user community and implement required solutions when possible;
iv. to interface with the participating space agencies to assist in providing system upgrades if recommended;
v. to interface with manufacturers to certify their transmitter products and to provide engineering assistance to them to insure their hardware operates correctly and efficiently with the Satcom systems, thereby increasing and optimizing Satcom systems usage;
vi. if applicable, to develop and maintain the ground system and the Global/Regional/National data processing centres; in the contrary, to provide liaison with the operators of the ground systems, and data processing centres in this regard;
vii. if applicable, to operate the Satcom systems ground segment; in the contrary, to provide liaison with the operators of the ground systems in this regard;
viii. if applicable, to operate the data processing centres under quality of service agreements and deliver data collected to the user community according to international standard data exchange requirements and protocols; in the contrary, to provide liaison with the operators of the data processing centres in this regard;
ix. to monitor and control the overall performances of the Satcom systems so as to guarantee the level of quality and continuity of service;
x. to promote the use of the Satcom systems and market new user communities, with the goal of minimizing the cost of using Satcom systems;
xi. to support users through responsive customer service for any request, claim or declaration of equipment;
xii. to support the Forum Executive Committee in Forum management and operations as might be needed;
xiii. to support ROMs as needed especially by facilitating access to and interaction between them and the user communities.

3.4 Representatives of the satellite equipment manufacturers

3.4.1 The representatives of the satellite equipment manufacturers (e.g. platform transmitter/transceiver terminals) can also participate in the Forum as observers.

3.4.2 The role of the satellite equipment manufacturers with regard to the Forum is:

i. to report to the Forum on the characteristics, performances, and costs of satellite equipment available or under development to be used for the transmission of environmental data from/to observing platforms in remote areas;
ii. to collect requirements from the user community and implement required solutions when possible;
iii. to report on the certification procedures for their transmitter/transceiver products, and ensure that their hardware operates correctly and efficiently with the Satcom systems, thereby increasing and optimizing Satcom system usage;
iv. to monitor and control the overall performances of the equipment so as to guarantee the level of quality of Satcom data transmission;
v. to support users through responsive customer service for any request, claim or declaration of equipment;
vi. to support the Forum Executive Committee in Forum management and operations as might be needed;
vii. to support ROMs as needed especially by facilitating access to and interaction between them and the user communities.

3.4 The Secretariats of the co-sponsoring Organizations

The World Meteorological Organization (WMO), and the Intergovernmental Oceanographic Commission (IOC) of UNESCO recognize that Satcom systems are important components for the implementation and sustainability of global environmental observing networks. WMO and IOC endorse the Forum as a mechanism to cost-effectively address the requirements of their Programmes and Co-sponsored Programmes, in particular in terms of Satcom and related data processing, quality control, data encoding according to international standards, and data distribution to their end users. In order to facilitate the Forum achieving its goals, the Secretariats of the co-sponsoring Organizations will provide support to the Forum Chairperson in the following manner:

i. Working with the Forum Executive Committee (Forum-EC), and its Chairperson to identify hosts for the regular meetings; and to work with the hosts to gather and disseminate logistical information to the participants;
ii. Providing financial assistance and administrative support to Forum participants who have been nominated by the Forum-EC to receive such assistance;
iii. Issuing Forum meetings' invitation letters to the ROMs with copies to the representatives of the co-sponsoring Organizations Members/Member States;
iv. Managing the documentation in preparation of the Forum meetings;
v. Participating at the Sessions of the Forum and its Executive Committee meetings;
vi. Preparing the session's final report template, and collaborating with the Chairperson, the Forum Executive Committee, and nominated individuals for recording the Session's decisions, and issuing reports of Forum Sessions;
vii. Finalizing the issuance and distribution of Session reports of the Forum to the co-sponsoring Organizations Members/Member States, as well as to the ROMs and other participants;
viii. Coordinating and communicating with the ROMs, the Forum Chairperson and the Executive Committee on all related issues during the intersessional periods;
ix. Serve as members of the Forum Executive Committee (*ex officio*).

The representatives of the co-sponsoring Organizations will participate in Forum Sessions as stakeholders, representing the interests of those Organizations.

Reimbursement to the co-sponsoring Organizations for their Administrative support may be made by the Forum based on voluntary contributions from the stakeholders. The amount reimbursed is to be

reviewed annually by the Forum-EC and approved by the Chairperson for the upcoming session.

4. Forum office bearers

4.1 The Forum elects a Chairperson and vice-Chairperson at Forum Sessions. The primary duty of the Chairperson is to ensure that the Forum activities and negotiations proceed in as open and equitable a way as possible, and to assist in reconciling the needs of Satcom systems stakeholders through fair discussions. The Chairperson chairs the Forum sessions, and represents the Forum during intersessional periods. The Chairperson also leads the Forum Executive Committee. The vice-Chairperson shall deputize for the Chairperson in his/her duties if required by the Chairperson.

4.2 The Terms of Reference for the Forum Chairperson, and the Forum vice-Chairperson, details about their election and terms are provided in Annexes D and E respectively.

5. The Forum Executive Committee (Forum-EC)

5.1 The function of the Forum Executive Committee (Forum-EC) is to conduct the sessional and intersessional business, as well as all other matters in support of the Chairperson's duties to meet the needs of the Forum members.

5.2 The Terms of Reference of the Forum Executive Committee are provided in Annex F.

6. Regular meeting of the Forum

6.1 Structure

The Satcom Forum meeting is an open meeting that solicits views from its stakeholders (ROMs, FRUGs, representatives of the satellite operators, service providers, VARs, and manufacturers of satellite equipment) in the view (i) to understand the state of the art regarding available Satcom systems, their potential for improvements, (ii) to address the needs of these bodies through discussions, and sharing of information for taking the best of each Satcom system, and (iii) to attempt to reconcile those needs through negotiation regarding future service level provision and costs.

The structure of the meeting consists of deliberative and report producing 3-day sessions organized typically every 2 years that are directed by the Chairperson to achieve the desired outcome. It is expected that the agenda, as adopted by the Forum at the start of the session, will be followed.

The Forum Session should be every two years, but the schedule may be changed at the discretion of the Chairperson.

6.2 Desired outcome:

The meeting is to be an open Forum for all ROMs and FRUGs to discuss and agree by consensus on any matter that affects their use of the Satcom systems. Outcome includes a final report of the meeting with a record of decisions and recommendations by the Forum. Information on the evaluated performances, and costs of existing Satcom systems for the collection of environmental data from remote observing platforms can also be an outcome of the meeting.

6.3 Invited participants

There is an open invitation to all stakeholders to attend the Forum regular meetings. However, official invitation by the co-sponsoring Organizations will be made to the following:

- ROMs representing the users of Satcom systems of Members/Member States of the co-sponsoring Organizations
- FRUGs representing specific Satcom systems user groups

Representatives of the Satcom systems operators and service providers, representatives of the satellite equipment manufacturers, and other interested parties are welcome to attend the Forum regular meetings. Formal invitation letters may be issued to them by the Secretariat on case by case basis.

6.4 Secretariat

It is expected that Secretariat support for the Forum meetings will be provided by the co-sponsoring Organizations on a rotating basis.

6.5 The typical agenda for Forum meetings is provided in Annex G.

7. Typical intersessional workplan and reporting process

The actual workplan will be implemented by the Chairperson and will include a combination of meetings, teleconferences, and email. A typical intersessional workplan and the reporting process is detailed in Annex H.

ANNEX A

TERMS OF REFERENCE OF THE INTERNATIONAL FORUM OF USERS OF SATELLITE DATA TELECOMMUNICATION SYSTEMS

[this annex will include the Terms of Reference of the Forum, once approved by the WMO and IOC Executive Bodies]

ANNEX B

TERMS OF REFERENCE OF THE SATCOM FORUM REPRESENTATIVE OF THE CO-SPONSORING ORGANIZATIONS MEMBER/MEMBER NATION/MEMBER STATE (ROM)

The Representative of the co-sponsoring Organizations Member/Member State (ROM):

1. shall be nominated by the Permanent Representative of a WMO Member or the Action Addressee of an IOC Member State;

2. should collect evolving requirements from Member/Member Nation/Member State users of Satellite Data Telecommunication systems (Satcom systems) and bring these to the attention of the Forum;

3. could designate an alternate to act on its behalf at Forum meetings by means of a letter to the Forum Chairperson;

4. decides on nominations and proposals put forward by the Forum Executive Committee (Forum-EC);

5. is the only authority in the Forum to represent the Member/Member Nation/Member State user groups and to decide on matters relevant to the Terms of Reference of the Satcom Forum;

6. should initiate interaction with their users, or act as the focal point when deemed to be appropriate or being considered necessary;

7. will provide basic support to existing and new users based on information made available by the Forum or Satcom system providers;

8. interact with Satcom system providers when deemed to be necessary or required;

9. participate in the regular negotiations initiated by the Forum for the tariff and service level of specific Satcom systems;

10. monitor the usage of the Satcom systems by its users;

11. will provide a report to the Forum meeting at least one month prior to the meeting date, in a format following the current reporting structure;

12. should, upon request of Satcom system providers, not distribute or communicate commercially sensitive information provided by Satcom system providers to the ROMs.

ANNEX C

TERMS OF REFERENCE OF A SATCOM FORUM REPRESENTATIVE OF A USER GROUP (FRUG)

Satcom Forum Representatives of a User Group (FRUGs) are designated through either of the following mechanisms:

i. An agency or consortium (candidate) who wishes to be represented through a FRUG consults with the Satcom Forum Chairperson to check whether there is already a FRUG representing a similar community in the Satcom Forum;
ii. If such a FRUG already exists, the candidate negotiates whether it could be represented through that FRUG;
iii. If such a FRUG doesn't already exist, the candidate provides the Chairperson with the proposed Terms of Reference for the FRUG, and the name of the individual proposed to be the FRUG, and requests these to be added in the list of FRUGs;
iv. The Chairperson consults with the Forum-EC, and makes an informed recommendation to the next Forum session whether the new FRUG should be accepted or not;
v. The FRUGs are formally endorsed at the regular Forum sessions.

In this context a Representative of User Group' (FRUG) is defined as follows, with the following Terms of Reference:

i. A FRUG will be an individual who can fairly represent the overall consensus view of a significant user community regarding the use of Satcom systems. Such communities might reasonably include the operators of specific environmental observing stations, e.g. Automatic Weather Stations (AWS), polar observing stations, data buoys, floats, ice platforms, animal tags, ship stations and airborne stations, or bodies with agreed international responsibilities for the promotion, sponsorship or validation of any aspect of environmental observation using Satcom systems (e.g. IOC, WMO, FAO, WWF).
ii. The FRUG will work with Satcom system providers and the Forum Executive Committee to identify opportunities that might bring the Forum session into closer contact with his/her user group, with a view to establishing within that group the benefits of the Forum process.
iii. It is accepted that for certain user groups (e.g. animal trackers), accreditation as above might be difficult to establish in the short term. Nonetheless the Forum-EC will work proactively to seek and encourage the identification of FRUGs as essential components of the Forum.
iv. Notwithstanding the above, the Forum sessions are open with observer status to any interested person (see Forum TORs).
v. If accredited, a FRUG will be obliged to consult as widely as possible with his/her user community regarding their use and expectations of the Satcom systems, and to make the results of these consultations publicly available well in advance of Forum sessions.
vi. The FRUG will also be expected to act as an impartial focal point for the dissemination of relevant information regarding Satcom systems that might be of benefit to his/her user community.
vii. In return, the FRUG will receive a letter of accreditation, and may be able to request some level of financial support from the Forum for attendance at meetings and for other activities approved by the Forum-EC.
viii. The FRUG will work with Satcom system providers and the Forum-EC to identify opportunities that might bring the Forum session into closer contact with his/her user group, with a view to establishing within that group the benefits of the Forum process.

ANNEX D

TERMS OF REFERENCE OF THE SATCOM FORUM CHAIRPERSON

The primary duty of the Chairperson is to ensure that the Forum activities and negotiations proceed in as open and equitable a way as possible, and to assist in reconciling the needs of Satcom systems stakeholders through fair discussions. The Chairperson chairs the Forum sessions, and represents the Forum during intersessional periods. The Chairperson also leads the Forum Executive Committee.

The Forum shall elect a Chairperson and vice-Chairperson at Forum Sessions. The term for the Chairperson will be for four years. The Chairperson shall be eligible for re-election in his/her capacity as Chairperson, but only for one subsequent term.

Terms of Reference for the Forum Chairperson:

1. The Chairperson shall be impartial and shall not favour any particular group, organization or country;

2. In consultation with the Executive Committee (Forum-EC), the Chairperson shall prepare the agenda, and confirm the venue for the annual session for distribution by the secretariat;

3. The Chairperson shall conduct the annual session of the Forum, and promote free, equitable and open discussion of agenda items;

4. The Chairperson shall convene intersessional meetings of the Forum-EC as necessary;

5. The Chairperson shall regularly liaise with Satcom system providers with regard to developments that might impact the Forum and its members;

6. The Chairperson shall routinely circulate information to the Forum participants during the intersessional period as appropriate;

7. The Chairperson shall deputize the vice-Chairperson if required;

8. The Chairperson shall represent the agreed views, decisions, and requirements of the Forum at various appropriate meetings, and report back on the outcomes to subsequent meetings of the Forum-EC and Forum;

9. The Chairperson, assisted by members of the Forum-EC if required, shall prepare and finalize reports of the Forum and its Forum-EC, and submit them to the Secretariats for publication if necessary;

10. The Chairperson shall seek contributions to the Satcom Forum Trust Fund, advise on the use of the funds, and authorize spending following consultation with the Forum-EC in accordance to the guidance provided by the Forum;

11. The Chairperson, in consultation with the Forum-EC and other stakeholders, shall review candidate representatives of user groups (FRUGs), and make informed recommendation in this regard to the Forum;

ANNEX E

TERMS OF REFERENCE OF THE SATCOM FORUM VICE-CHAIRPERSON

The Forum shall elect a Chairperson and vice-Chairperson at Forum Sessions. The term for the vice-Chairperson will be for four years. The vice-Chairperson shall be eligible for re-election in his/her capacity as vice-Chairperson, but only for one subsequent term.

Terms of Reference for the Forum vice-Chairperson:

- The Chairperson shall deputize the Vice-Chairperson for all of the duties (except for item number 7 of the Forum Chairperson's ToR) if required.

ANNEX F

TERMS OF REFERENCE OF THE SATCOM FORUM EXECUTIVE COMMITTEE

The function of the Forum Executive Committee (Forum-EC) is to conduct the sessional and intersessional business, as well as all other matters in support of the Chairperson's duties to meet the needs of the Forum members.

Terms of Reference

The specific tasks of the Forum-EC are to:

1. Assist the chairperson in the preparation of reports, and their submission, if needed, to the Secretariats of the co-sponsoring Organizations for distribution.

2. Annually review the functions and duties of the Forum and recommend any changes to the Chairperson for discussion and approval at the Forum Session.

3. Analyze the Forum budget, and advises the Chairperson.

Membership

1. The membership shall include:

i. Chairperson
ii. Vice-Chairperson
iii. Three additional members proposed by the Chairperson and elected by the Forum. These members will serve a term of 4 years with an optional 4-year appointment
iv. Representatives of the Forum sub-programmes
v. Representatives of the co-sponsoring Organizations (*ex officio*)
vi. Representative of Operators and service providers of Satcom systems (*ex officio*)
vii. Representative of Satellite equipment manufacturers (*ex officio*)

2. Careful consideration should be made to ensure a proper mix that represents co-sponsoring Organizations Members/Member Nations/Member States, user groups, and subject matter experts.

Meetings

1. As necessary, the Chairperson will convene and organize all Forum-EC meetings. The meetings can be in person, or teleconference.

2. If decisions are needed by the Forum-EC as permitted/requested by the Forum Session or the Chairperson during the inter-session, elections for those decisions may be organized with a quorum consisting of at least four members of the Forum-EC, including the Chairperson or his nominated deputy.

ANNEX G

TYPICAL AGENDA FOR A SATCOM FORUM SESSION IN YEAR *YYYY*

1. ORGANIZATION OF THE MEETING

    1.1 OPENING OF THE MEETING
    1.2 ADOPTION OF THE AGENDA
    1.3 WORKING ARRANGEMENTS
    1.4 SELECTION OF THE WRITING GROUP (WG)[1]

2. REPORT OF THE CHAIRPERSON OF THE FORUM

    2.1 REPORT ON THE FORUM-EC
    2.2 REVIEW OF ACTIONS

3. USER GROUP REPORTS

4. REPORT ON THE SUB-PROGRAMMES

5. REPORT ON THE DEVELOPMENT OF SATCOM SYSTEMS

6. REVIEW OF USER'S REQUIREMENTS AND ISSUES

7. SATCOM SYSTEMS REVIEW, AND PERFORMANCE EVALUATION

8. REPORT ON TARIFF ISSUES AND RELEVANT NEGOTIATIONS BY THE FORUM SUB-PROGRAMMES

9. REVIEW OF THE OPERATING PRINCIPLES

10. FUTURE PLANS AND PROGRAMMES

11. ANY OTHER BUSINESS

12. ELECTION OF THE CHAIRPERSON, VICE-CHAIRPERSON, and FORUM-EC MEMBERSHIP

13. DATE AND PLACE OF THE NEXT MEETING

14. CLOSURE OF THE MEETING

1: The purpose of the WG is to assist the Secretariats in taking the minutes and compiling a draft report of the proceedings for approval of the Forum.

ANNEX H

TYPICAL SATCOM FORUM INTERSESSIONAL WORKPLAN AND REPORTING PROCESS

Step no.	***Time frame***	***Step/Action***
1	T0-5 months	Invitation letters issued by the co-sponsoring Organizations for the next Forum session
2	T0-4 months	Contributors are invited by the Secretariat to provide written input for the Forum Session (deadline 1 month)
3	T0-1 months	Preparatory documents for the Forum Session are made available to all participants through website
4	T0	Forum Session
5	T0+2 months	E-mail from the Secretariat informing ROMs about the achievements of the Forum session (final report on the web)
6	T0+3 months	Chairperson consults with Forum-EC, outlines the work to be accomplished and assign actions to Forum-EC
7	T0+6 months	Status of actions assigned by the previous Session of the Forum. Make adjustments as necessary
8	T0+6 months	Chairperson communicating to the Forum on recent outcomes, and plans for the next Session

_____

ANNEX V

UPDATED WORKPLAN LEADING TO THE FORMAL ESTABLISHMENT OF THE FORUM

Step	***Action***	***Date / Deadline***	***By***
1	Approach Co-sponsors in the view to agree on the draft Terms of Reference for the Forum; and plan/organize an preparatory workshop for the establishment of the informal Forum.	Aug. 2011-Jan. 2012	IOC, WMO Secretariats
2	Approach operators of satellite data telecommunication systems and platform transmitter terminal, identify contact points, and discuss/negotiate the level of their contributions/participation	Jan - May. 2012	Secretariats[1]
3	Approach users of satellite data telecommunication, inform them about the Forum, and seek their participation in the Forum and the *ad hoc* [informal] Forum workshop	July-Dec. 2011	Secretariats[1]
4	Setup an organizing committee of the *ad hoc* [informal] Forum workshop with Terms of Reference and membership (see draft below)	Apr. 2012	Preparatory workshop
5	Negotiate with potential hosts, and propose a venue for the *ad hoc* [informal] Forum workshop	Mar. – Sep. 2012	Organizing Committee
6	Inform the joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) about developments regarding the Forum, and seek further guidance	May 2012	Secretariats of WMO and IOC
7	Issue invitation letters for the *ad hoc* [informal] Forum workshop	June 2012	Secretariats[1]
8	Inform the WMO Commission for Basic Systems (CBS) Implementation Coordination Team on Integrated Observing Systems (ICT IOS) about developments regarding the Forum, and seek further guidance	June 2012	Secretariats[1]
9	Inform the Implementation Coordination Team on Information Systems and Services (ICT-ISS) about developments regarding the Forum, and seek further guidance	June 2012	Secretariats[1]
10	Coordinate documentation plan with contributors	June-Sep. 2012	Secretariats[1]
11	Inform the CBS about developments regarding the Forum, and seek further guidance	Sep./Oct. 2012	WMO Secretariat
12	Propose agenda and documentation plan for the *ad hoc* [informal] Forum workshop	Sep. 2012	Organizing Committee
13	Issue invitation letters for the *ad hoc* [informal] Forum workshop		Secretariats[1]
14	Seek documents from contributors to the documentation plan	Sep. – Dec. 2012	Secretariats[1]

1: Secretariats of WMO, IOC

15	the *ad hoc* [informal] Forum workshop is tasked to: • Review current satellite data telecommunication issues, • Identify areas where progress/proposals can be made • Review and adjust as needed the draft Terms of Reference of the Forum, • Review the proposed operating principles of the Forum, including Terms of Reference of the Forum's Executive Committee • Elect an interim Forum Executive Committee for the Forum, Refine the workplan for formal adoption of the Forum by the Executive Bodies of the co-sponsor Organizations	2013	Organizing Committee and the Secretariats[1]
16	Terms of Reference of the Forum submitted to the parent Organizations Executive Bodies for approval and formal establishment of the Forum	2013	Executive Bodies of WMO,IOC
17	Plan for the first meeting of the Forum	2014	Interim Executive Committee, and the Secretariats[1]
18	First official meeting of the Forum	2014/2015	Interim Executive Committee, and the Secretariats[1]

ANNEX VI

BACKGROUND INFORMATION REGARDING THE SATCOM FORUM INITIATIVE

Preliminary note: This proposal is open to all satellite data telecommunication systems used for the collection of environment data from remote platform to serve the needs of WMO, and IOC applications, e.g. DCP (EUMETSAT, NOAA/NESDIS, JMA,…), INMARSAT, IRIDIUM, ARGOS, etc.

1 INTRODUCTION

The WMO Sixteenth Congress (Cg-XVI, Geneva, Switzerland, 16 May – 3 June 2011) supported the establishment of an International Forum of Users of Satellite Data Telecommunication Systems (Forum) covering a wide user basis, and to address remote data communication requirements - including tariff negotiations as needed - for automatic environment observing systems coordinated through WMO and partner organizations such as IOC.

The historical background leading to this decision is provided in Appendix A.

2 HISTORICAL BACKGROUND

The Argos Joint Tariff Agreement (JTA) was established in 1981 (WMO EC-XXXIII) to be an effective, constructive and cooperative organizing and negotiating mechanism contributing significantly to the stability of the Argos data collection and location system and its globally expanded applications. In February 1984 (IOC EC-XVII) the Intergovernmental Oceanographic Commission of UNESCO (IOC) agreed to co-sponsor the JTA with the WMO. The objective of this cooperative effort was to provide fair, cost-effective and simple procedures for users of the system. Programmes eligible for the preferential tariff under this agreement were limited to those funded by the government and/or non-profit agencies. Issues such as user requirements, improvements of the space-based Argos platform, and surface-based system data processing capabilities are also discussed through the JTA.

Since its establishment in 1985, the WMO-IOC Data Buoy Cooperation Panel (DBCP) has been closely associated to the JTA and has been influential in promoting the WMO and IOC requirements for buoy data collection, location, data processing, and distribution onto the Global Telecommunication System (GTS) of the WMO. Thanks to the DBCP action, the following Argos related activities could be achieved in the best interest of DBCP users:

(i) Development of a dedicated data processing system of Argos collected data for their conversion into geo-physical units, automatic quality control, encoding into appropriate WMO codes, and insertion onto the GTS;
(ii) Implementation of a global network of regional Argos receiving stations in order to improve data timeliness;
(iii) Argos system improvements that take into account DBCP requirements for higher data rate telecommunication, and downlink capability (including an DBCP Argos-3 Pilot Project);
(iv) Automatic collection of instrument/platform metadata by the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) *in situ* Observing Programme Support Centre (JCOMMOPS); and
(v) Publication of DBCP Technical Documents on the use of the Argos system (DBCP TD No. 3) and related GTS data processing and quality control (DBCP TD No. 2).

However, in recent years, with the advent of new satellite data telecommunication systems that better address user requirements in a cost effective way, the Argos system is no longer in a *de facto* monopolistic situation for the collection and location of drifting buoy data. Pilot activities have also been initiated by JCOMM to evaluate the use of other systems such as Iridium. Looking at integration aspects, this new situation has lead the JCOMM Pilot Project for the WMO Integrated Global Observing System (WIGOS) to promote the establishment of an international Forum of users of satellite data telecommunication systems, with a wide user base reaching out beyond the operators of

ocean observing systems, to address tariff negotiations, user requirements, and make recommendations on deficiencies and gaps related to the use of such systems. Through this type of Forum, it is expected to reduce satellite data telecommunication costs for the transmission of observations from observational platforms to data processing centres on land, and better address user requirements for high temporal and vertical resolution data, and improved timelines.

This issue was presented to the fifth Session of the WMO Commission for Basic Systems (CBS) Expert Team on Requirements and Implementation of Automatic Weather Stations (ET-AWS) at its fifth Session, Geneva, 22-25 June 2010. ET-AWS considered the needs of member countries for communication of real-time data from Automatic Weather Stations (AWS), recognised the existing JCOMM arrangement in negotiating Tariff Agreements with ARGOS, and noted the recommendation from the JCOMM Pilot Project for WIGOS to work towards establishing an international Forum of users of satellite data telecommunication systems. ET-AWS also recognized that there would be benefit in having a strong user base covering multiple applications to address system deficiencies, negotiate tariff and potential improvements of the rendered services with the operators of satellite data telecommunication systems.

The issue was further discussed at the sixth Session of the CBS Implementation/Coordination Team on the Integrated Observing System (ICT/IOS), Geneva, Switzerland, 28 June – 2 July 2010, and the extraordinary session of the CBS, Namibia, 17-24 November 2010, which lead to specific recommendations made to the WMO Congress.

3 PROPOSAL

WMO Congress decisions

Cg-XVI requested the WMO Secretariat to approach the partner organizations, and coordinate with the Argos Joint Tariff Agreement (JTA) with the view to establish such a Forum during the next intersessional period.

Cg-XVI emphasized that such a Forum should not only consider tariff negotiations but should take a very broad view of available technologies, options and prices as well as cooperative mechanisms through the Data Collection Platform (DCP) services of meteorological satellites.

In particular, there was concern during Cg-XVI that data from many Antarctic stations funded by research agencies are not available in real-time and, therefore, are not available to NWP systems. Cg-XVI noted that the high communication cost involved in using Iridium satellites is also a limiting factor. Cg-XVI requested the Executive Council, and the Secretary-General, in collaboration with the Commission for Basic Systems (CBS) and the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) to investigate possible ways to reduce such costs through an international Forum of users of satellite data telecommunication systems. It was also recognized that the WMO Information System (WIS) would provide a suitable environment for collection and dissemination of data from research observing stations.

Governance

It should be noted that, once established the Forum shall report to the executive bodies of the co-sponsor Organizations through mechanisms defined by each Organization.

WMO Governance

Regarding the WMO side of the governance, it was proposed to place the Forum under the responsibility of the CBS, who shall coordinate closely on related issues with JCOMM.

The Forum will be reporting to the WMO Executive Council through the CBS.

The twelfth session of the CBS Management Group (CBS-MG-XII) considered the proposed road map

leading to the establishment of the International Forum of Users of Satellite Data Telecommunication Systems. It endorsed the Preliminary Draft Terms of Reference (Appendix A, doc 6.1) for a WMO-IOC-FAO International Forum of Users of Satellite Data Telecommunication Systems and requested the Open Programme Area Group on Information Systems and Services (OPAG-ISS) to take the responsibility for the establishment of the Forum and coordinate closely this activity with the Open Programme Area Group on Integrated Observing Systems (OPAG-IOS).

IOC Governance

The Forum governance by the Intergovernmental Oceanographic Commission (IOC) of UNESCO is still to be discussed with this International Organization.

Proposed workplan

CBS-MG-XII reviewed and endorsed the proposed workplan leading in principle to the formal adoption of the Forum in 2013 (Appendix A, doc 6.4). To realize this, the Secretariats of the co-sponsor Organizations will work together in the view to set up an organizing committee, refine the draft terms of reference for the Forum, and organize an *ad hoc* workshop in late 2012. The *ad hoc* workshop will be tasked to:

- Propose operating principles, including Terms of Reference of the Forum's Executive Committee
- Adjust the draft Terms of Reference proposed by the Secretariats,
- Elect an interim Executive Committee,
- Review current satellite data telecommunication issues,
- Identify areas where progress/proposals can be made
- Refine the workplan for formal adoption of the Forum by the Executive Bodies of the co-sponsor Organizations

4 CONCLUSIONS

The workshop is invited to take note of this proposal, make recommendations as appropriate regarding the governance, proposed workplan.

_____

ANNEX VII

TERMS OF REFERENCE AND MEMBERSHIP OF THE ORGANIZING COMMITTEE FOR THE *AD HOC* WORKSHOP (2013)

The Organizing Committee for the *ad hoc* workshop shall:

- Negotiate with potential hosts, and propose a venue for the *ad hoc* workshop
- Investigate establishment of a trust fund, seek potential contributors, and propose initial budget for supporting the Forum's activities
- Propose agenda and documentation plan for the *ad hoc* workshop
- Organize the session of the *ad hoc* workshop

The membership of the Organizing committee includes:

- Chair, David Meldrum (UK)
- Johan Stander (EC-PORS)
- Sean Burns (CGMS Secretariat)
- Eric Locklear (USA)
- Mariuxi Chavez (Spain)
- Fabienne Jacq (France)
- Wolfgang Marxer (Germany)
- Tom Gross (IOC Secretariat)
- Etienne Charpentier (WMO Secretariat)

_____

ANNEX VIII

USEFUL SATCOM CRITERIA

The following is a list of criteria which may be described in tables published by the Satcom Forum describing the specifications of satellite operators or requirements of users.

- Transmission Frequency - Determines size and type of antenna
- Type of service (packet or streaming) - Some platforms perform better when using packet systems.
- Packet size and repetition rate, or streaming data rates - Care should be taken to understand actual data rates
- Timeliness: Getting data onto GTS not as automatic with Iridium.
- Availability, are satellites available. Not a problem with geostationary satellites if you are within view of a satellite and not in the polar regions. Not a problem with big LEO systems.
- Performance in different environments, such as extreme temperatures, rough oceans.
- Power Consumption - This is very important on some platforms.
- Inherent Positions - Positions calculated inherently through the signal transmitted by platforms without the need for a GPS receiver can reduce power consumption significantly
- Long Term Viability of Satellite System - Users and manufacturers both need long term stability in order to optimize planning of instrument production and deployment.
- Availability - Not simply telemetry coverage, but including regional governmental restrictions and frequency interference.
- Technical Support.

_____

[Page left intentionally blank]

[Page left intentionally blank]