Report of the 42nd Meeting of the
Coordinated Group for Meteorological Satellites

Parallel Working Group Sessions: WGI Report

PARALLEL WORKING GROUP SESSIONS

WG I REPORT

WG I/0 Objectives

As agreed during the plenary session of CGMS-41, Mr. Marlin O. Perkins (NOAA) and Mr. Joaquin Gonzalez (EUMETSAT) acted as Chair and Rapporteur respectively, of Working Group I (WG I) on Global Issues on Satellite Systems and Telecommunication Coordination.

WG I comprised representatives of the satellite operators from CMA, CNSA, EUMETSAT, ISRO, JAXA, JMA, KARI, KMA, NOAA, ROSCOSMOS, ROSHYDROMET, and WMO (see Annex for the detailed list of participants).

The Agenda proposed by the CGMS Secretariat prior to the meeting, was discussed and adopted and the Working Group agreed that a number of WebEx-based presentations would be given during predefined time-slots during the meeting and, when necessary, the sequencing of the presentations would need to be adapted to these slots. However, during the WG I meeting, a modification was included in agenda item WG I/4 (Data Collection System) as EUM-WP-20 (PPT) regarding a proposal from EUMETSAT for the harmonisation of global Data Collection Systems which was considered to be more focused after all agencies have provided their dedicated report on the status of their regional Data Collection Systems (including EUMETSAT in CGMS-42-EUM-WP-19) with the following modifications:

Moved from agenda item I/4: International data collection and distribution and proposed under agenda item WG I/3, Direct broadcast services, the following Working Papers were discussed in WG I/3.1 Direct read-out stations:

CGMS-41-NOAA-WP-13 Fast delivery initiatives using direct broadcast with extensions wherever possible

CGMS-41-NOAA-WP-09 Recommendations seeking affordable receiving stations

CGMS-41-EUMETSAT-WP-17 (Presentation) EARS Roadmap (EUMETSAT Advanced Retransmission Service)

Added to agenda item I/4: International **CGMS-41 NOAA-WP-08**: Status of the International Data Collection System (IDCS)

WG I/1 Review of actions and recommendations from previous meetings

The final status of the list of WG I actions and recommendations resulting from CGMS-41, following CGMS-42 deliberations is available here.

WG I/2 Frequency management matters: SFCG, ITU and WRC activities

EUMETSAT-WP-16 on frequency management topics provides an overview on World Radiocommunication Conference 2015 (WRC-15) related issues of relevance to EUMETSAT and

MetSat systems/operators in general. WRC-15 agenda items of most relevance to MetSat include agenda items 1.1, 1.6, 1.9.2, 1.10, 1.11, 9.1.1 and 10.

Furthermore, MetSat issues not directly related to WRC-15 considered within ITU-R Working Party 7B of ITU-R Study Group 7 as well as within the framework of the SFCG are summarized in this document.

WRC-15 Agenda Item 1.1

This agenda item deals with consideration of additional spectrum allocations to the mobile service and identification of additional frequency bands for International Mobile Telecommunications (IMT) and to facilitate the development of terrestrial mobile broadband applications, likely to concentrate on bands below 6 GHz.
The main frequency bands at risk for MetSat systems, the embarked instruments and related services MetSat operators use are expected to be:

- the 1695 – 1710 MHz bands used for meteorological satellite applications;
- the 2025 – 2110 MHz and 2200 – 2290 MHz bands used for earth exploration satellite and space operation (TM/TC and ranging) services;
- the 3400 - 4200 MHz band used for dissemination of meteorological data in the framework of GEONETCast;
- the 5350-5470 MHz active remote sensing band used for SARs,
- scatterometers and altimeters.

Agenda Item 1.1: 1695 – 1710 MHz

According to the fast track implementation plans for broadband mobile in the US, the 1695-1710 MHz band will likely be proposed by the US for a global identification of this band for broadband mobile systems in the framework of WRC-15 agenda item 1.1.

This triggered consideration of the suitability of this band for broadband mobile implementation in the relevant ITU preparatory group for this Agenda Item, namely the ITU-R Joint Task Group 4-5-6-7.

Meanwhile the sharing studies in the framework of JTG 4-5-6-7 are completed for this band. The results are summarized in Draft New Report ITU-R SA.[METSAT 1.7 GHz] (Sharing assessment between meteorological satellite systems and IMT stations in the 1 695-1 710 MHz frequency band) which is based on three sets of studies from China, the USA and EUMETSAT.

The report shows that the required protection area around MetSat stations from which potential IMT base stations in the 1 695-1 710 MHz frequency band would be up to several hundred kilometres. Therefore, sharing between IMT base stations and MetSat stations in the 1 695-1 710 MHz frequency band is not feasible.

Regarding the assessments of protection areas around MetSat stations from which IMT mobile terminals in the 1 695-1 710 MHz frequency band would have to be excluded, this report provides diverging results depending on the assumptions, parameters, and methodologies used.

Two of the three studies (Annexes A and B) depict required separation distances from 46 kilometres (GSO case) and 60 kilometres (NGSO case) up to more than 120 kilometres (NGSO case), even considering low rural deployment and conclude that sharing is not feasible between IMT mobile terminals and MetSat stations in the 1 695-1 710 MHz band. The study in Annex C provides an example calculation resulting in separation distances ranging from 32 to 46 kilometres (NGSO case) and concludes that sharing between IMT mobile terminals and MetSat stations is feasible.

In the discussions in JTG 4-5-6-7 on this issue there were only a very limited number of administrations present in the consideration of this band with no representatives from mobile operators or mobile equipment manufacturers. Currently there is only one country actively supporting this band, drawing a positive conclusion on the sharing between IMT mobile terminals and MetSat stations. It can be expected that this situation will not change significantly towards WRC-15.

In the framework of the European (European Conference of Postal and Telecommunications Administrations (CEPT)) preparation for WRC-15, this band is noted to be widely used by meteorological satellites systems (space to Earth), leading to the conclusion that this use represents a large number of receiving Earth stations that would not be compatible with typical mobile deployment. In addition, this band is not considered relevant for mobile service due to the limited bandwidth available. CEPT therefore considers as a preliminary position that the frequency band is not suitable for broadband mobile implementation.

Agenda Item 1.1: 2025 – 2110 MHz and 2200 – 2290 MHz

Although these bands do not seem to play a major role in the global identification of additional spectrum for broadband mobile systems, there are still some proponents for these bands (or parts of) in the mobile industry and by some individual countries. Thanks to NASA, which provided sharing studies between IMT systems and data relay satellite (DRS) forward and return links operating in the 2 025-2 110 MHz and 2 200-2 290 MHz frequency bands, a negative conclusion on the sharing capabilities was drawn within ITU-R JTG 4-5-6-7, resulting in Draft New REPORT ITU-R SA.[2 025 - 2290 MHz] (Feasibility assessment for accommodation of mobile broadband IMT systems in the 2 025-2 110 MHz and 2 200-2 290 MHz frequency bands). With this new study earlier ITU-R studies as summarized in Recommendation ITU-R SA.1154 are reaffirmed that resulted in the adoption of RR No. 5.391 at WRC-97, which prohibits high-density mobile systems from operation within these frequency bands.

Although, all attempts to identify these bands for broadband mobile have been successfully countered so far, there is still the probability that individual countries will propose parts of these bands for broadband mobile systems on the basis of band segmentation in preparation for or as input to WRC-15. Thus, it is necessary to continue to closely monitor the developments in the

discussion on these bands at ITU-R and regional level, in order to ensure that these important bands for MetSat systems are secured for long-term availability for the MetSat operators. According to the preliminary CEPT position, these bands are not considered suitable for a broadband mobile identification.

Agenda Item 1.1: 3400 - 4200 MHz

This frequency range is one of the prime targets of the mobile industry to cover their broadband spectrum requirements. Some parties even go as far as to propose the entire C-band (3400 – 4200 MHz) for a mobile broadband identification. However, there is also very strong opposition by all commercial satellite operators and a number of countries around the world against identifying further spectrum in this frequency range. Note: Already at WRC-12 the 3400-3600 MHz band was allocated to the mobile service and identified for International Mobile Telecommunications (IMT) in a number of countries by footnotes RR No. 5.430A, 5.431A, 5.432A, 5.432B and 5.433A to the Radio Regulations. From the sharing studies performed in ITU-R JTG 4-5-6-7 it is concluded that co-frequency sharing between Fixed-Satellite Service (FSS) earth stations and IMT macro-cell or small-cell outdoor networks would not be feasible in the same geographical area when the FSS earth stations and/or IMT stations are deployed in a ubiquitous manner and/or with no individual licensing of earth stations, since no minimum separation can be guaranteed.

In view of the incompatibility between IMT systems and Earth stations in the FSS a designation of the entire 3400 – 4200 MHz band for mobile broadband would be detrimental for the commercial satellite operators, and thus the service providers supporting the dissemination of meteorological data via GEONETCast in the long term.

However, identification of the entire C-band mobile broadband system is very unlikely, given the strong opposition from various sides. A more probable scenario would be that parts of the 3400 – 4200 MHz band would be globally identified for mobile broadband systems implementation, thus still retaining spectrum available for FSS systems that could continue to be used for the dissemination of meteorological data.

For example the preliminary position of CEPT currently is that the 3400 – 3800 MHz band could be globally designated to broadband mobile at WRC-15 and the 3800 – 4200 MHz band should be kept available for the FSS for the deployment of satellite Earth stations in the long term.

Agenda Item 1.1: 5350 – 5470 MHz

Under this agenda item the extension of the current RLAN (WiFi) spectrum (5150-5350 MHz and 5470-5725 MHz) by also allocating the gap in between (5350-5470 MHz) for RLANs was also under discussion.

The additional allocation of the 5350-5470 MHz band would affect SARs such as CSAR on Sentinel-1 or RadarSat most severely. Less sensitive to RLAN interference but also potentially affected in the

long term by such an RLAN introduction in the 5350 – 5470 MHz band could be scatterometers and altimeters.

All studies performed so far in ITU-R JTG 4-5-6-7 agreed that, with the current RLAN parameters, compatibility cannot be achieved, even if the RLAN systems are limited to indoor use only. Thus, there is a need to see if additional mitigation techniques could give compatibility. One study indicates that an eirp mask imposed on RLAN would do so. Another study proposes using an orbit avoidance concept, based on the knowledge by the RLAN devices of the EESS satellites orbital positions and their channel usage avoidance during the satellites visibility periods. Other studies indicate that none of these two methods (or other methods previously considered) would work for multiple reasons associated with insufficient mitigation, technical problems with the implementation, and the impossibility for administrations to enforce and verify these mitigations on unlicensed mass-market devices, or a combination of the above reasons.

A final conclusion on the compatibility with EESS (active) instruments and the effectiveness of the necessary mitigation measures will need to be drawn at ITU-R level at the last meeting of JTG -4-5-6-7 in July 2014.

It is important to note that the last JTG meeting in February 2014, also received a number of sharing studies which show incompatibility of RLANs with terrestrial and aeronautical radars operating in the 5350 – 5470 MHz band.

With those additional elements, the incompatibility with active sensors is no longer considered to be the only sharing problem. Now the full extent of the sharing problems with the incumbent services is on the table and can be assessed by administrations when they develop their position on whether to support or oppose an introduction of RLANs in the 5350 – 5470 MHz band.

There is still no common view in CEPT on this band.

WRC-15 Agenda Item 1.6

This agenda item, under 1.6.1, dealt with consideration of possible additional primary allocations to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1.

Agenda item 1.6.2 dealt with consideration of possible additional primary allocations to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the 13-17 GHz range.

One of the targeted frequency bands for a possible allocation of FSS (Earth-to-space) is 13.25 – 13.75 GHz, which raises particular concerns with regard to the allocation of this band to EESS (active). This band is used for active remote sensing (altimeters and scatterometers) by missions such as Cryosat, Jason-2/-3, Jason-CS, Sentinel-3, and HY-2.

Sharing studies between EESS (active) and FSS (space-to-Earth) performed so far show compatibility between both services.

Regarding sharing between EESS (active) and FSS (Earth-to-space) studies performed so far still show diverging results. Studies from the US, ESA, and CNES show limited compatibility between EESS (active) and FSS (Earth-to-space) while studies from Luxembourg indicate large degrees of compatibility. Thus, a negative impact of an allocation to FSS (Earth-to-space) could currently not be excluded and therefore such a new allocation to FSS in the uplink direction should be opposed. In parallel, work is being undertaken in the ITU-R in Study Group 7 to support sharing studies in the affected EESS (active) bands. For this purpose Working Party 7C is working on the Preliminary Draft Revision of Report ITU-R RS.2068: Current and Future Use of the Band 13.25-13.75 GHz by Spaceborne Active Sensors".

The need for additional primary allocations of 250 MHz (Earth-to-space and space-to-Earth) to the GSO FSS in frequency bands between 10 and 17 GHz in Region 1 is recognized and supported within CEPT. However, an allocation can be made only if studies demonstrate compatibility with the existing services in these frequency bands. At this stage, based on studies provided, CEPT does not support FSS (Earth-to-space) allocation in the13.25-13.75 GHz band, but identifies the 13.4-13.65 GHz band as a possible frequency band for a new primary allocation of 250 MHz to GSO FSS (space-to-Earth) subject to development of possible mitigation technique if required.

WRC-15 Agenda Item 1.9.2

This Agenda Item dealt with the possibility of allocating the 7375-7750 MHz and 8025-8400 MHz bands to the maritime-mobile satellite service (MMSS) and additional regulatory measures, depending on the results of appropriate studies. The potentially affected space science service bands under this agenda item are 7450 - 7550 MHz MetSat (space-to-Earth, GSO) and 8025 - 8400 MHz EESS (space-to-Earth). Thus, no new allocations to the MMSS should be made in these frequency bands unless acceptable criteria for sharing with the science services are developed.

Of particular concern is the potential interference to EESS (space-to-Earth) operations in 8025-8400 MHz at high latitudes from ships operating in closer proximity. Large exclusion zones may be needed to avoid interference to EESS Earth stations. Many EESS Earth stations are located near coastal areas (e.g., Svalbard, McMurdo, Maspalomas, Lannion, Wallops) and could be seriously affected by emissions from vessels navigating in the area.

All compatibility analysis on the two different sharing aspects (MMSS vs. EESS and MMSS vs. the space research service (SRS)) came to similar conclusions regarding the sharing difficulties with EESS and the required separation distances to protect the SRS Earth stations. To summarise the results of this compatibility analysis, Preliminary Draft New Report SA.[MMSS 8-GHz] was developed in the framework of ITU-R WP 7B.

Furthermore, the issue of the large number of exclusion zones and the regulatory mechanisms for implementing and keeping up-to-date the necessary exclusions zones makes such an allocation to

the MMSS impracticable. Consequently, CEPT does not support an allocation for MMSS in the 8025-8400 MHz band without acceptable and practicable regulatory methods.

WRC-15 Agenda Item 1.10

This agenda item dealt with the consideration of spectrum requirements and possible additional spectrum allocations for the mobile-satellite service (MSS) in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, within the frequency range from 22 GHz to 26 GHz.

The main frequency bands at risk for CGMS member agencies could be:

- The EESS (passive) band 23.6-24 GHz (purely passive, but to be protected against unwanted emissions taking into account interference apportionment and the levels contained in ITU-R Resolution 750 (rev. WRC-12));
- The first 500 MHz of the EESS/SRS space-to-Earth band 25.5-27.0 GHz.

The frequency band 25.5 – 27 GHz is allocated to the EESS (space-to-Earth) and is used for data links for EESS payloads. Relevant sharing criteria for this service are given in Recommendation ITU-R SA.1027.

Studies have been performed with SRS receiving Earth stations tracking non-GSO SRS satellites. These studies, using protection criteria given in Recommendation ITU-R SA.609, show no compatibility between MSS downlink and SRS. Since the sharing criteria in Recommendation ITU-R SA.1027 are globally more stringent than the protection criteria in Recommendation ITU-R SA.609, it is expected that similar conclusions would apply to the EESS (space to-Earth). With regard to MSS uplinks, it has been shown that separation distances greater than 330 km would be required for SRS. These distances would be even be greater when considering EESS.

So far, the frequency bands targeted by the proponents of such new allocations to the MSS are still not clear. Thus, the developments in preparation for this WRC-15 agenda item needs to continue to be carefully monitored.

CEPT does not support any such additional allocations to the MSS under this agenda item.

WRC-15 Agenda Item 1.11

This agenda item dealt with the consideration of a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range. Initially proposed by ESA through CEPT, this agenda item called for the identification of a suitable frequency band for an EESS (Earth-to-space) allocation in the 7-8 GHz range for telecommand operations to complement telemetry operations of EESS (space-to-Earth) in the 8025 - 8400 MHz band.

Although there is currently no MetSat system envisaged that would make use of such a new allocation in the near future, such a spectrum would enlarge the potential evolutions of future MetSat systems and deployment scenarios:

- Compatibility between EESS (Earth-to-space) and the space research service or the space operation service in the 7100- 7235 MHz band (Preliminary Draft New Report ITU-R SA.[EESS 7-8 GHz_SHARING-SPACE]);
- Compatibility between EESS (Earth-to-space) and the potential Fixed Satellite Service (under agenda 1.9.1) in the 7100-7235 MHz band (Preliminary Draft New
- Report ITU-R SA.[1.9.1VS1.11-7GHz]);

- Sharing between the EESS (Earth-to-space) and the fixed service in the 7-8 GHz range (Draft new Report ITU-R SA.[EESS-FS-7GHz]).

In addition ITU-R WP 7B dealt with the determination of the spectrum requirements for a potential new EESS uplink allocation. A bandwidth of 60 MHz was considered appropriate to cover the spectrum requirements for this new EESS uplink allocation.

CEPT supports such an allocation on a primary basis to the EESS (Earth-to-space) in the 7190-7250 MHz frequency band, recognizing that sharing with SRS (deep space) in the 7145-7190 MHz band is considered not feasible.

WRC-15 Agenda Item 9.1.1

This agenda item dealt with Resolution 205 (REV.WRC 12) - Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz.

Cospas-Sarsat space segment providers have developed protection criteria for the Cospas-Sarsat search and rescue instruments and local user terminals in the 406.0-406.1 MHz band in order to protect them against broadband out-of-band emissions and against narrow-band spurious emissions. These protection criteria have been recognized at the ITU-R level through ITU-R M.1478-1. However, they do not provide protection against emissions in adjacent bands which could hinder the Cospas-Sarsat system's ability to detect and/or relay signals from beacons.

Several noise measurements have been conducted using all three space components. The measurements of the 406 - 406.1 MHz band must be carefully examined, as Cospas-Sarsat has a general concern about the reception and processing of weak distress signals, in certain areas, caused by an increase in noise in Europe and Asia.

Current analysis of observations show that over certain years, this noise (measured in the 406 - 406.1 MHz band) has increased by 15 to 20 dB above the interference level in some areas. Measurements performed at 406 MHz have shown that the noise level is especially high over Europe and also confirm concerns about parts of Asia. This noise issue in the UHF band addresses the

possibility that the frequency range between 390 MHz and 420 MHz might be caused by the operation of terrestrial systems deployed in many countries.

Thus, Cospas-Sarsat with the support of its space segment providers will need to develop the relevant protection criteria for submission to the relevant ITU-R groups and translation into an ITU-R recommendation.

In this context, the potential impact from EESS, MetSat and MetAids systems in the 401-406 MHz range also had to be assessed. Preliminary analysis has shown that for data collection platforms in operation within the frequency 401- 403 MHz band, the aggregate transmitter power does not exceed the broadband interference threshold, assuming a maximum load of the Earth exploration-satellite systems. Operation of radiosondes in the meteorological aids service will also not exceed the broadband measured sensitivity levels of the search-and-rescue receivers for LEO, MEO or GEO satellites.

In order to ensure adequate protection of MSS systems in the 406- 406.1 MHz frequency band, the revision of Resolution 205 is required introducing further mitigation measures. These would also include design and implementation of improved filters at the LEOSAR, GEOSAR and MEOSAR systems' space receivers, which are already planned for future generations of satellites.

CEPT supports a revision of Resolution 205 (REV.WRC 12) to contain appropriate mitigation measures, however, without unduly constraining duly authorised existing stations/systems operating in adjacent frequency bands.

2.7 WRC-15 Agenda Item 10

Agenda Item 10 of WRC-15 calls for proposals for possible agenda items for WRC-18. CNES and EUMETSAT, supported by France and Germany, proposed to CEPT an agenda item for WRC-18 to upgrade the secondary allocations to the MetSat (space-to-Earth) and the EESS (space-to-Earth) in the 460- 470 MHz band to primary in order to secure future use of the band for ARGOS-4.

The objective of such an agenda item for WRC-18 is to improve the regulatory status of the MetSat (space-to-Earth) and the EESS (space-to-Earth) services in the 460- 470 MHz frequency band while putting relevant constraints on these services in order to protect the existing primary (mobile, fixed) services. This proposal was added to the CEPT "shopping list" for WRC-18 agenda items for further consideration.

NOAA voiced its support at last year's SFCG-33 meeting for such an agenda item for WRC-18 and announced that a similar proposal would be put into the US preparatory process for WRC-15.

The proposed agenda item was also included in the SFCG WRC-15 objectives as given in Resolution SFCG 32-1R1.

3 WRC-15 unrelated MetSat issues currently under discussion within ITU-R

3.1 Characteristics, sharing and performance criteria of EESS and MetSat

ITU-R WP 7B performed work at its last meetings towards revising and potentially merging existing ITU-R Recommendations dealing with MetSat and EESS systems in terms of characteristics, sharing and performance criteria, leading to the following two new Preliminary Draft New Recommendations:

- ITU-R SA.[EES/MET CHAR]: "Characteristics to be used for assessing interference to systems operating in the Earth exploration-satellite and meteorological-satellite services and for conducting sharing studies";
- ITU-R SA.[EES/MET METH]: "Protection criteria for MetSat and EESS services".

At the meeting of WP 7B in September 2013, rather than proceeding with these two new PDNRs, WP 7B agreed to review the existing ITU-R Recommendations providing protection criteria for MetSat and EESS services, here in particular Recommendations ITU-R SA.1026 and SA.1027. It was concluded that the work on the complementary criteria as contained in ITU-R SA.[EES/MET METH] should rather be progressed in the SFCG in the framework of inter-agency coordination.

Regarding the PDNR ITU-R SA.[EES/MET CHAR], as this PDNR is closely related to PDNR ITU-R SA.[EES/MET METH], the work on this PDNR will also be progressed in the framework of the SFCG.

Therefore, work on these PDNRs will not be progressed in the framework of WP 7B for the time being.

3.2 Data collection platforms in the 401 - 403 MHz band

Two new ITU-R Recommendations have been in force since December 2013 for the 401-403 MHz band:

- ITU-R SA.2044 "Protection criteria for non-GSO data collection platforms in the band 401 - 403 MHz";
- ITU-R SA.2045 "Basic general partitioning and sharing conditions for the 401- 403 MHz band for future long-term coordinated use of data collection systems on geostationary and non-geostationary MetSat and EESS systems".

This basic general partitioning plan for the 401- 403 MHz band, initially developed by SFCG and endorsed by CGMS, is now also published as an ITU-R Recommendation

4 WRC-15 unrelated MetSat issues currently under discussion within SFCG

4.1 MetSat use in the 1670 – 1710 MHz band

Changes in the use of the 1670 - 1710 band for various MetSat services, such as expanded data dissemination by GOES and the use of emergency weather information distribution systems, showed a need to review Recommendation SFCG 11-1R3 (adopted in 2005) to ensure its accuracy and that it continues to assist in the most optimum use of this meteorological satellite service band 1670 – 1710 MHz.

Therefore, SFCG-33 agreed action item 33/4 which requests SFCG members to review Recommendation SFCG 11-1R3 considering their present and future planned use of the band and propose recommended changes. These proposed changes will be gathered, summarised by a dedicated responsible person (in this case from NOAA) and presented to SFCG-34 (3 – 11 June 2014) with the aim of updating this recommendation dealing with the use of the 1670- 1710 MHz band.

4.2 MetSat use in the 7750 – 7900 MHz band

In order to ensure the continued efficient use of this recently enlarged band from 7750-7850 MHz to 7750-7900 MHz at WRC-12, it was considered necessary to review Resolution SFCG 19-7R3 with a view to assisting in the most optimum use of this MetSat band 7750-7900 MHz, providing a guideline to Metsat operators, which are currently in the phase of planning and developing next generation polar orbiting systems using this band.

For this purpose SFCG action item 33/5 was agreed to review Resolution SFCG 19-7R3 considering their present and future planned use of the band and propose recommended changes. These proposed changes will be gathered, summarised by a dedicated responsible person (in this case from EUMETSAT) and presented to SFCG-34 with the aim of updating this recommendation dealing with the use of the 7750-7900 MHz band.

WG I thanked EUMETSAT for the detailed report provided on the frequency related topics of interest to CGMS (European area).

CGMS WG I also wanted to reiterate to SFCG the appreciation of CGMS for the support provided in protecting and preserving the frequency bands assigned or related to the activities of CGMS.

CGMS-42-WMO-WP-07 reported on the outcome of the WMO Steering Group on Radio-Frequency Coordination (SG-RFC), which had updated, at its last meeting in March 2014, the preliminary WMO position on the agenda items of the 2015 World Radiocommunication Conference related to frequency bands or issues of interest or concern for meteorology and related fields. This document was provided to WG I for consideration and feedback, with a view to building strong support along those lines in forthcoming ITU Study Group discussions and ultimately at WRC 2015.

This document reflects the preliminary position of the World Meteorological Organisation (WMO) on the agenda of World Radiocommunication Conference 2015 (WRC-15). Ten WRC-15 Agenda items are related to frequency bands or issues of prime interest or concern for meteorology and related fields. There are also eight WRC-15 Agenda items that may potentially have an impact on WMO interests, either due to their wide open scope in terms of frequency ranges under study or in relation to a potential general interest.

Agenda item 1.1

WMO opposes allocation/identification for terrestrial mobile broadband applications including IMT of the 1675-1710 MHz, 2 025-2 110 MHz and 2 200-2 290 MHz frequency bands.

WMO is also opposed to any mobile allocation in 2700-2900 MHz which would impose any sort of constraints on meteorological radars operations and design (such as modification of radar equipment).

WMO is also extremely concerned about and opposed to an allocation/identification for RLAN in the 5350-5470 MHz band, since it will in particular endanger the operation of current and planned EESS systems. WMO is of the view that any of the current mitigation techniques proposed so far is impracticable to implement and maintain. In particular, the introduction of a data base/orbit avoidance of EESS (active) systems cannot be seen as a potential solution to enable compatibility. Furthermore, the protection of all meteorological radar use of the band must be ensured.

WMO opposes any allocation in the 1 400-1 427 MHz frequency band, covered by RR No. 5.340, and also requires that protection of sensors in this band be ensured against unwanted emissions of terrestrial mobile broadband applications including IMT if proposed in the adjacent bands. In such a case, WMO would strongly request the adoption of mandatory limits in the Radio Regulations consistent with current ITU-R studies. In addition, WMO states its requirement to maintain relevant fixed satellite service capacity and availability in the 3 400-4 200 MHz frequency band.

Agenda item 1.6 (including both 1.6.1 and 1.6.2):

WMO opposes a new allocation to FSS (Earth-to-Space) in the 13.25-13.75 GHz frequency band. If this band was proposed for a new allocation to FSS (Space-to- Earth), then relevant protection of EESS (active) sensors in that band would have to be ensured.

WMO also opposes any allocation in the 10.6-10.7 GHz frequency band. WMO requires that protection of EESS (passive) sensors in the 10.6-10.7 GHz band be ensured against unwanted emissions of FSS systems.

Agenda item 1.9

WMO is concerned with regard to potential interference to EESS (space-to-Earth) operations in 8 025-8 400 MHz from ships operating in proximity and considers it impracticable to implement separation distances of several hundred kilometres from MMSS stations to a large number of EESS Earth stations. WMO is therefore opposed to a new allocation to MMSS (Earth-to-space) in the 8025-8400 MHz frequency band.

Agenda item 1.10

WMO opposes new MSS allocations in the 23.6-24 GHz and 25.5-26.0 GHz frequency ranges. Allocations to MSS in other portions of the 22-26 GHz frequency range will have to be associated with the adequate protection of EESS applications from emissions of MSS systems.

Agenda item 1.11

WMO supports a new EESS (Earth-to-space) allocation in the 7-8 GHz frequency band, provided that compatibility with meteorological-satellite systems operating in the 7450-7550 MHz and 7750-7900 MHz bands is ensured.

Agenda item 1.12

WMO urgently calls for a new EESS (Earth-to-space) allocation in the 9 GHz frequency range to ensure adequate protection of meteorological applications, in particular, meteorological radars in the 9300-9500 MHz frequency band and passive sensors in the 10.6-10.7 GHz frequency band.

Agenda item 1.17

WMO opposes the use of the 2700-2900 MHz and 5350-5460 MHz frequency bands for WAIC based on the approved ITU-R studies which conclude that sharing between meteorological radars and WAIC is not feasible in these bands.

If other frequency bands were to be considered for WAIC (e.g. the 13.25-13.4 GHz frequency band or frequency bands above 15.7 GHz), compatibility with meteorological and Earth observation applications would need to be assessed and adequate protection ensured.

Agenda item 9.1.1

WMO supports studies and regulatory measures towards ensuring the adequate protection of Cospas-Sarsat receivers against emissions from adjacent bands, noting that, to a large extent, these receivers are implemented on meteorological satellites.

Agenda item 9.1.5

WMO states its requirement to maintain relevant fixed-satellite service capacity and availability in the 3 400-4 200 MHz frequency band.

WMO supports technical and regulatory actions to protect the FSS operations in the 3400-4200 MHz band for the dissemination of meteorological data in Region 1 and would support a revision of Resolution 154 (WRC-12) calling for relevant administrations in Region 1 to use special care in the coordination, assignment, and management of frequencies.

Other WRC-15 Agenda items that may potentially have an impact on WMO interests are agenda items 1.3, 1.5, 1.9.1, 1.18, 7, 9.1.2, 9.1.6, and 9.1.8. WMO will monitor developments under these Agenda items and react accordingly in order to protect meteorological interests.

Detailed justifications of the WMO positions are given in **CGMS-42-WMO-WP-07**.

CGMS satellite operators are invited to communicate and take into account these views in addressing WRC-2015 preparation at their respective national levels.

WG I noted the detailed positions on WMO regarding the relevant WRC-15 agenda items and confirm that these positions are fully in line with the ones adopted by the different CGMS members in the different regional areas in which the preparatory activities of WRC-15 are taking place.

WG I also reiterated the need of CGMS members to closely and regularly liaise with their national frequency management/regulation authorities on the importance of the frequency bands assigned/associated to MetSats and EESS and the need to protect/preserve them. These regular activities shall ensure that adequate awareness is raised, and maintained, with the national authorities that will convey national positions to the WRC and reminded all CGMS members that no CGMS member is a member of ITU with voting rights (according to the definition of ITU membership which is done at national signatory level). WMO therefore also emphasized the need to bring the same approach to the regional level (e.g. CEPT in Europe).

WG I also noted the resolution of the WMO Executive Council asking its CBS to pursue intensive preparations for WRC-15, in collaboration with other relevant international bodies, in particular, the Coordination Group for Meteorological Satellites and the Space Frequency Coordination Group.

Following the discussions, one action and one recommendation were raised:

CGMS-42 actions – WG I						
Actionee	Action	#	Description	Deadline	Status	HLPP ref
CGMS members	WG I/2	A42.01	CGMS members to provide feedback to WMO (David Thomas, Dthomas@wmo.int) on the updated preliminary WMO position on frequency protection for WRC-2015.	30 June 2014	OPEN	HLPP# 1.3.3

CGMS-42 recommendations – WG I						
Actionee	Rec	#	Description	Deadline	Status	HLPP ref
CGMS space agencies	WG I/2	R42.0	CGMS satellite operators are invited to communicate and take into account the WMO position on frequency protection when addressing WRC-2015 preparation at the national level.	CGMS-43	OPEN	HLPP# 1.3.3

CGMS-42-NOAA-WP-05 reported on the implementation of the 2010 President's Broadband Initiative, which remains a U.S. government priority. The date and criteria for auction of the 1695-1710 MHz band resulting in sharing between POES, Metop and commercial broadband providers have been defined. There are other spectrum sharing ideas originating with U.S. industry that have required technical analysis and coordination domestically and abroad.

LightSquared, LLC, has performed technical analyses leading to a decision to share the 1675-1680 MHz band with current GOES back-up operations and NOAA radiosondes.

Finally, NOAA spectrum specialists have continued to work on routine domestic and ITU filings for current and future NOAA spacecraft.

Sharing of 1695-1710 MHz:

NOAA continues preparations to share the 1695-1710 MHz band with commercial broadband providers. US law requires the band to be auctioned as early as September 2014, with a winner announced late in 2014. NOAA estimates that the earliest a company would be in a position to start using the band would be about three years after the winner is certified. NOAA submitted the required Transition Plan to the National Telecommunications and Information Administration (NTIA) in January 2014. Key features of the Transition Plan include:

- Use of an existing on-line design portal in which commercial vendors could design their deployed systems near NOAA facilities. NOAA will verify that the proposed design does not cause harmful interference;
- Design and deployment of a spectrum monitoring system at each of the 27 documented critical sites. This system would be capable of quickly identifying the location and strength of signals causing interference to NOAA operations;
- Relocation of the National Weather Service radiosonde broadcasts to approximately 406 MHz; and,
- Full reimbursement of all costs including several years of operations.

NOAA stated in the Plan that full funding must be in place before work begins. NOAA committed to a 39-month deployment schedule, following receipt of funding, for the monitoring system.

LightSquared Interest in 1675-1680 MHz:

LightSquared, LLC, desires to combine 5 MHz of spectrum between 1670-1675 MHz, which it already occupies, with the adjacent 1675-1680 MHz band, which NOAA occupies, to give it the continuous 10 MHz it requires to begin operating its terrestrial broadband system. Lightsquared contracted with a NOAA contractor and signed an MoU with NOAA to conduct a feasibility analysis for sharing the 1675-1680 MHz band. The study was in two phases:

- Phase 1 was a study to determine the feasibility of moving the NWS radiosondes from 1675-1683 MHz to 406 MHz. This phase was completed in the autumn of 2013 and concluded that it was feasible for the radiosonde move. Funding for this move was requested in the 1695-1710 MHz Transition Plan.
- Phase 2 was a study to determine if Lightsquared could operate without harmful interference to GOES and GOES-R operations in the adjacent 1675-1695 MHz band. Preliminary results show that large exclusion zones would be required around critical NOAA

sites. This phase is not yet completed because the GOES-R ground system installation is not yet complete.

If the study shows that sharing is possible, Lightsquared would still be required to comply with the Federal Communications Commission (FCC) decision concerning Lightsquared's proposal before sharing begins. The decision space for the FCC includes granting Lightsquared's request in its present form, deciding to hold an auction for the spectrum among Lightsquared and its competitors, or simply denying Lightsquared's proposal. In addition, there are several unresolved bankruptcy court proceedings and ongoing civil lawsuits, in which Lightsquared is either the defendant or the complainant, which will have a major bearing upon Lightsquared's viability as a company.

Routine and Other Spectrum Management Work:

NOAA continues to coordinate domestically and internationally on numerous issues involving existing and future satellite systems. Significant work included:

- Overcrowding of S-band: Recent problems finding frequencies for DSCOVR and COSMIC-2 point to problems with overcrowding of the S-band frequencies allocated for satellites: 2220-2290 MHz. NOAA has found a large discrepancy between the International Telecommunications Union (ITU) and the Space Frequency Coordination Group (SFCG) databases for systems registered in this band. During several sessions of the 2013 SFCG meeting, it was clear that countries and space agencies are not being diligent updating the database. Inaccurate data bases significantly hamper the ability to perform analyses and defend those portions of the spectrum which an incumbent either "owns" or shares. NOAA has requested that the SFCG perform an end-to-end review of all of its data bases.
- Routine ITU and NTIA filings for JPSS and Jason-3.
- GOES-R Stage III filing approved in December 2013.
- The activation and increased use of the new Virginia Spaceport at Wallops, Virginia, U.S.A., resulted in numerous short deadline interactions with NASA and commercial launch companies to coordinate frequency use during space launches from the new Wallops launch site, which is only several kilometres from NOAA's Wallops Command & Data Acquisition Station.

The world-wide commercial desire for additional spectrum is increasing and the competition is intense. NOAA and our CGMS partners must apply adequate resources to respond to new initiatives and to develop new and innovative ways of operating meteorological satellites and distributing data to users and customers. It is critical that CGMS members engage in frequent formal and informal dialogue in order to ensure continuity of operations in the future.

For further details on any satellite radio frequency issue, NOAA encourages CMGS members to consult with their SFCG counterparts or to review information found at: http://www.sfcgonline.org.

WG I thanked NOAA for the report provided on the frequency related topics (NOAA area) and noted the progress made on the implementation of the 2010 President's Broadband Initiative and the efforts made to ensure that operational systems and the services they provide users are not affected by the results of the Broadband initiative.

CGMS-42-NOAA-WP-06 provided a description of current and future NOAA satellite networks as well as a list of radio frequencies used/to be used by these networks.

WMO reiterated the ready availability of the WMO Observing System Capability Analysis and Review Tool (OSCAR), encouraging WG I members to provide and keep WMO updated with the frequency information of their present and future Systems.

Note: CGMS-41-WMO-WP-23 presented a summary of the satellite module of the Observing Systems Capability Analysis and Review Tool (OSCAR), available to the public at www.wmo.int/oscar, which provides information on EO satellite frequencies (http://www.wmo-sat.info/oscar/satellitefrequencies).

Comment on summary report and SFCG approach

CGMS WG I wanted to re-iterate to SFCG the appreciation of CGMS for the support provided in protecting and preserving the frequency bands assigned or related to CGMS activities. CGMS WG I recalled that at CGMS-40, CGMS nominated the Frequency Manager of EUMETSAT as the liaison officer between CGMS and SFCG. CGMS WG I noted with appreciation the work done so far by the liaison officer.

CGMS WG I noted the efforts identified in the different Working Papers to concentrate the discussions on frequency coordination and management topics in the framework of SFCG. Discussing how to better use the time and resources of both SFCG and CGMS WG I, it was proposed to use the identified liaison officer to also report back from SFCG on the topics of relevance to CGMS to allow all frequency management and coordination issues between CGMS members (but also members of SFCG) to be addressed in an expert forum as it is in SFCG.

To ensure that CGMS is informed of any issue needing dedicated attention within CGMS WG I, the following recommendation and related action were agreed:

CGMS-42 recommendation – WG I						
Actionee	Rec	#	Description	Deadline	Status	HLPP ref
CGMS members	WG I/2	R42.02	CGMS WG I, understanding the complexity of the issues to be covered in the area of frequency management and coordination (including interference assessments) for the existing and future space systems under the responsibility of the different CGMS members, and also recognising the efforts, already in place by most of the CGMS members, to concentrate these discussion in the frame of SFCG, recommends CGMS members to continue bringing all frequency management and coordination issues under the expert forum of SFCG and actions the liaison officer (from CGMS to SFCG) to report to CGMS WG I all aspects of SFCG discussions considered of relevance to CGMS.	(CGMS-43)	OPEN	HLPP# 1.3

CGMS-42 action – WG I						
Actionee	Action	#	Description	Deadline	Status	HLPP ref
EUM (CGMS liaison officer)	WG I/2	A42.02	CGMS Liaison officer to SFCG to report to CGMS WG I on the discussions and disposition of SFCG on all topics of interest to the different CGMS members. For achieving that a dedicated CGMS Secretariat WG I working paper will be prepared by EUMETSAT Frequency Manager (in the role of liaison officer from CGMS to SFCG) and will be released to the participants of WG I before end of Q1 of the corresponding year. Based on the contents, CGMS members will decide the level of information they will include in their specific reports to CGMS for the corresponding WG I meeting.	30 Mar 2015	OPEN	HLPP# 1.3

WG I/3 Direct Broadcast Services

WG I/3.1 Direct read-out stations

There were no papers presented under this agenda item during CGMS-42. Nevertheless, the need to maintain this agenda topic was discussed (and confirmed) under the revision of the HLPP (parts relevant to WG I).

WG I/3.2 Coordination and global standards

WG I/3.2.1 Optimisation/harmonisation of direct readout dissemination (CGMS DB global spec)

CGMS-42 NASA-WP-05 highlighted NASA's Direct Readout program. The prime objective is to enable real-time data access of Earth remote sensing data. Through the use of Direct Broadcast (DB) on EOS and Suomi NPP satellites, real-time environmental data is made available on a continuous basis world-wide. Having regional data access, three additional elements are necessary to render DB data useful by the general application user: instrument specific algorithms along with data processing tools to handle a live data stream, data product formatting or data transport tools and, product distribution mechanisms for decision support systems. This paper addresses these elements and their availability to the public as NASA's contribution to enabling the use of space-borne remote sensing data for real-time applications.

The ultimate goal of the direct broadcast or network-based remote sensing data user is to arrive at an understanding of its regional environment dynamics and derive information for decision support. The extent of DB's utility is therefore directly proportional to the ability of the user to provide the derived information to a decision-making infrastructure; whether it is a large farmer assessing a fungal infestation or the federal government assessing the extent of damage caused by a tornado. Both require a mechanism or path for real-time DB products to reach appropriate decision-making bodies.

NASA, as a science research organisation, has developed space-borne remote sensing instruments and corresponding science algorithms to measure and quantify geophysical parameters for use in understanding and quantifying climate change. Many of these algorithms, although for use on a global and longer temporal scale, are applicable for real-time regional applications. The Direct Readout programme, in order to bridge the gap between NASA science and the end- user application, has developed support technologies and ported science algorithms, as described, to function in a Direct Readout environment for direct use by such application users. These are freely available for download at http://directreadout.sci.gsfc.nasa.gov.

CGMS-42 NOAA-WP-23 provided an update on the development of the direct readout service on the Joint Polar-orbiting Satellite System (JPSS) and the GOES-R satellites. It is planned that JPSS carry an X-band service similar to the NASA EOS and NOAA Suomi NPP spacecraft. The HRD service will transmit a full complement of instrument data. GOES-R will make available an HRIT/EMWIN service which will be a combination of the LRIT and NWS' Emergency Managers Weather and Information Network (EMWIN) services. The GOES Re-Broadcast (GRB) service will replace the GVAR transmission on the current GOES spacecraft. NOAA's current direct broadcast services will change dramatically in data rate, data content, and frequency allocation, driving changes to field terminal configurations. Direct readout data users must employ new field terminal receivers unique to each particular broadcast service.

WMO asked about the possibility of using GEONETCast to support data delivery in the pre-operational phase as a risk reduction measure (at user level) for GRB readiness. WG I identified this

point to be addressed through recommendation CGMS-41 WG IV 41.20: NOAA to consider the provision of an LRIT like subset of GOES-R or GOES-S data over GNC-A, at least on a transitional basis to support operational users in RA III and RA IV with limited technical infrastructure. In **CGMS-42-NOAA-WP-20** NOAA responds that it will assess the possibilities of including a subset of the GOS-R/S in GNC-A. NOAA must consider the best options for the data format and data content. CGMS members and the WMO Space Programme will be kept abreast of any considerations for including GOES-R/S data in GNC-A broadcast. However, the CGMS Secretariat recalled to WG I that the HLPP contains a dedicated entry regarding support to users (in the 2014-2018 timeframe) and this HLPP objective is not limited to NOAA and GOES-R but applies to all CGMS members and the future systems that are to be deployed in the 2014-2018 timeframe (e.g. GOES-R and JPSS, MTG, Himawari 8, FY-3E/F, FY-4, etc.) and therefore agreed the following actions:

CGMS-42 action – WG I						
Actionee	Action	#	Description	Deadline	Status	HLPP ref
CGMS members	WG I/3.2.1	A42.03	CGMS members to regularly report to WG I their plans on the user preparation for their future systems (in areas aspects relevant to the WG I).	CGMS-43	OPEN	HLPP# 1.4.2
CGMS members	WG I/3.2.1	A42.04	CGMS members to gather responses from manufacturers of receiving stations about experiences and lessons learnt for both LEO and GEO systems. Due date: September 2014 and provided answers to be assessed in dedicated Inter-Sessional meeting in November 2014	15 Sep 2014, 15 Nov 2014	OPEN	HLPP# 1.4.3

CGMS-42 NOAA-WP-29 provided a simplified description of the steps required to decode the NOAA GOES LRIT mission specific data transmissions into LRIT application files. This document is primarily intended for developers to allow implementation of NOAA LRIT specific processes such as Rice decompression of image files. It is important to note how this document is organized. Examples of the usage of this code are included in the main body of this paper with more specific examples in the WP Appendix. It is important to note that the data flow diagrams (figures 1 and 3) are simplified examples and the reader must refer to the NOAA LRIT Receiver Specification and CGMS 03 HRIT/LRIT Global Specification for the specifics on processing the various data layers.

The intent of this document is to provide terminal software developers a visualisation of the data flow as it progresses through the various layers defined by the LRIT system specification(s) and a guideline for the implementation of the HRIT/EMWIN service for GOES-R/S. NOAA plans to reduce the user impact when transitioning from LRIT to HRIT/EMWIN. The new system will be capable of receiving the current GOES broadcasts as well as the new GOES-R/S services. This document serves as the basis for the development of the HRIT/EMWIN service that will be available on the GOES-R series of satellites.

WG I thanked NOAA for the report provided on the LRIT Mission Specific Data for GOES and the transition from LRIT to HRIT/EMWIN.

In view of the plans of the different CGMS members to deploy more advanced systems and instruments in the next two to six years, WG I debated the suitability of the existing CGMS Global specification for GEO systems (Global Specification 03) to efficiently format and disseminate L1 and L2 products and therefore agreed an action to assess its suitability and decide on additional steps accordingly (if possible even in inter-sessional meetings before CGMS-43).

CGMS-42 action – WG I						
Actionee	Action	#	Description	Deadline	Status	HLPP ref
CGMS members	WG I/3.2.1	A42.05	CGMS members to nominate focal points to support, via inter-sessional meetings, the analysis of the LRIT/HRIT Global Specification for its usefulness for next generation GEO satellite data dissemination, and propose an update taking into account the availability of new file format standards and dissemination means. Initial coordination to be done by EUMETSAT (as book captain of the document). Due date 30 June 2014	30 Jun 2014	OPEN	HLPP# 2.6

WG I/4 Data collection systems

CGMS-42-EUM-WP-19 presents the status of the EUMETSAT 0° and IODC Data Collection Services. The status of the High Rate Data Collection Platforms and DCP data dissemination mechanisms are also detailed.

Regional DCS (0°)

Channel utilisation

There are **223** regional channels (at 1.5 kHz spacing) available on the Meteosat-10 satellite, which supports the 0° Data Collection Service (DCS). Of these channels, **66** are used by 'older' DCPs, with 3 kHz spacing, (corresponding to 33.3 kHz channels). Therefore, **157** channels are available for 1.5 kHz DCPs. Of these channels, **47** have DCPs allocated. The upper part of the band has been set aside for HRDCP use. There are **110** 1.5 kHz Regional channels with no DCPs allocated. As older 3 kHz DCPs become obsolete, more channels will become available. The allocation is shown in Figure 1. This figure also shows the additional 11 Regional channels that were redistributed from the original 33 international channels following the agreement at CGMS-36, i.e. I01-I11 were allocated to NOAA for regional use, I23-I33 allocated to EUMETSAT for regional use. I12-I22 remain as international channels.

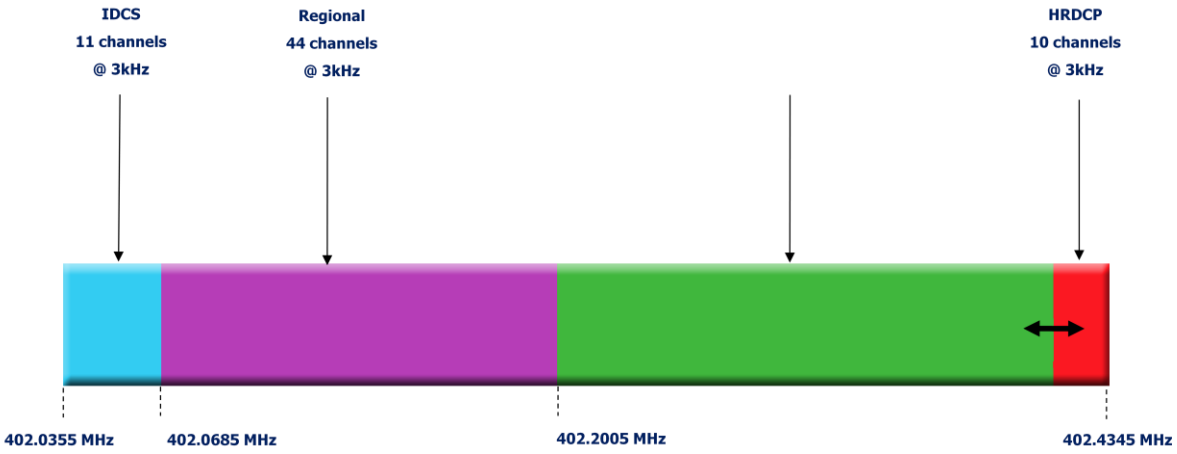


Figure 1 Allocation of International/Regional Channels of DCPs

Allocated/active DCPs

There are **1146** allocated DCPs, of which **762** are actively transmitting. Several transmitters are seasonal in nature.

Geographical distribution

DCPs transmitting via the 0° and IODC satellite are located in Europe, Africa and Asia. The following table and chart show the geographical distribution.

DCPs	Country	DCPs	Country	DCPs	Country	DCPs	Country
51	Algeria	1	Finland	3	Maldives	10	Tanzania
11	Angola	113	France	19	Mali	1	Thailand
2	Armenia	1	Gambia	1	Malta	2	Togo
3	Austria	44	Germany	3	Mauritania	4	Tunisia
1	Bangladesh	8	Ghana	4	Mauritius	1	Turkey
2	Belarus	1	Gibraltar	0	Morocco	48	UK
3	Benin	1	Greece	23	Mozambique	22	Ukraine
11	Botswana	11	Guinea	2	Myanmar	1	Union des Comores
1	Brazil	2	Guinea-Bissau	18	Namibia	61	USA
4	Bulgaria	19	Indonesia	23	Niger	2	Vietnam
6	Burkina Faso	2	Iran	16	Nigeria	1	Yemen
61	Cameroon	136	Iraq	10	Oman	15	Zambia
4	Cap Verde	9	Ireland	4	Pakistan	13	Zimbabwe
1	Central African Republic	96	Italy	3	Palestine		
3	Chad	3	Ivory Coast	3	Philippines		
2	Congo	0	Jordan	11	Republic of Moldova		
3	Croatia	4	Kenya	10	Republic of Seychelles		
1	Cyprus	6	Lesotho	12	Romania		
26	Democratic Republic of the Congo	11	Libya	11	Senegal		
		0	FYR Macedonia	35	South Africa		
2	Djibouti	2	Madagascar	7	Spain		Total = 1087 DCPs
1	Egypt	8	Malawi	3	Sri Lanka		
5	Falklands	1	Malaysia	2	Swaziland		

Table 1: Geographical distribution by country

Note (1) Larger numbers of DCPs are highlighted with darker colours. (2) Red entries indicate countries where DCP operation has ceased, green entries where it has commenced.

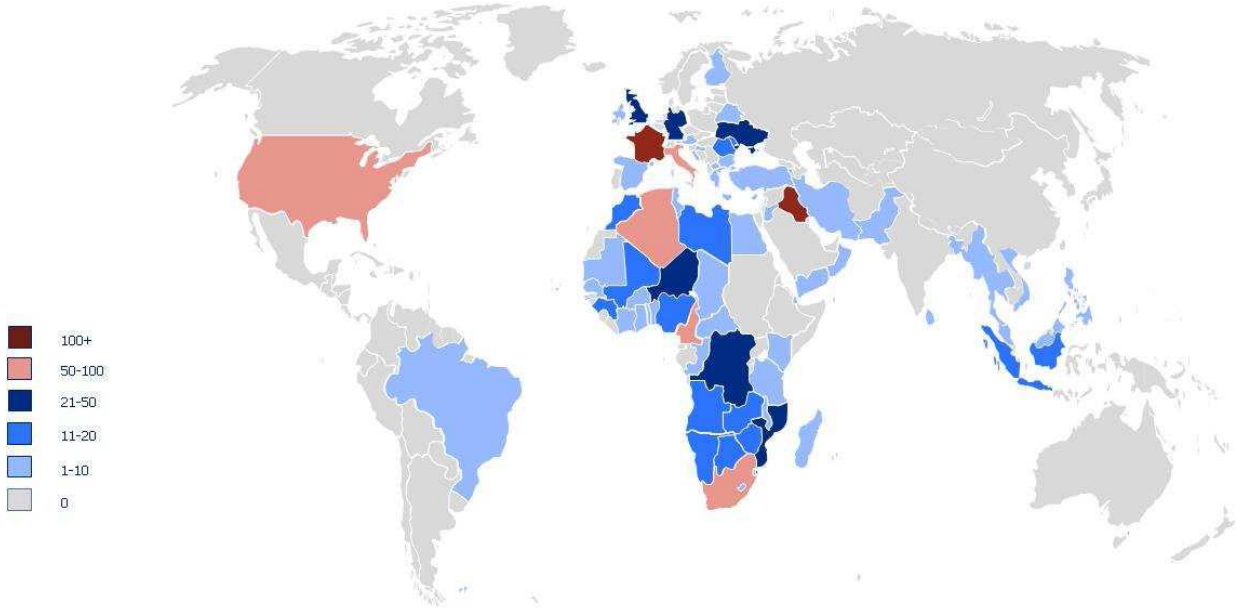


Figure 2: Geographical distribution of DCPs

IODC (57°)

Meteosat-7 is used for the provision of the IODC service, including the DCS. The prime application is for the Indian Ocean Tsunami Warning Network (IOTWS). There are plans for DCP networks in other Asian countries, however, further utilisation of Meteosat-7 is contingent on the use of HRDCPs due to the limited bandwidth available.

Channel utilisation

Due to interference with the 0° service, only the remaining 11 international channels have allocated for IODC use. As noted above, I01 – I11 were allocated to NOAA for regional use and I23-I33 to EUMETSAT for regional use. I12-I22 remain as international channels.

It has been agreed with NOAA that the 11 former international channels, now allocated to NOAA, can be used for IODC DCS applications on a non-interference basis.

Allocated DCPs

There are **60** allocated DCPs, of which **39** are actively transmitting. This is a 30% increase over 2013.

Outlook

International channel usage

Only one DCP is allocated as an international DCP. However, this DCP only transmits via the 0° spacecraft. It does not transmit via the NOAA or JMA satellites. Indeed, NOAA no longer supports 100 bps DCPs. It can therefore be regarded as a Regional Meteosat DCP.

Referring to **CGMS-42 EUM-WP-26 -** Roadmap for the future provision of Indian Ocean Data Coverage (IODC) services - it is clear that the remaining international channels utilised by Meteosat-7 should remain in place until an alternative to the DCS provided by Meteosat-7 is in place.

The international channels bandwidth is the only bandwidth currently available for 'non-regional' users, i.e. outside the CGMS members' bandwidth that is reserved in most cases for regional use only.

This topic should be revisited at each CGMS meeting, until a long-term alternative to the current Meteosat-7 DCS is decided.

HRDCP Status

EUMETSAT has recently published an updated TD16 – Meteosat Data Collection and Distribution, mainly covering the HRDCP specification and an updated certification process.
Several manufacturers are actively pursuing certification of HRDCP transmitters. In addition the European Space Agency (ESA) is preparing a design for European manufacturers to be able to build HRDCP transmitters. The first certified HRDCP is now planned for mid-2014.

CGMS-42-JMA-WP-08 reports on the present status of JMA's Data Collection System (DCS) and related future plans, highlighting a recent increase in the number of Data Collection Platform (DCP) stations at which DCS regional channels are used for better tidal/tsunami monitoring.

JMA has been operating the DCS since its first Geostationary Meteorological Satellite (GMS) was launched in 1977. As follow-on satellites to the current MTSAT-1R and MTSAT-2 spacecraft, Himawari-8 and Himawari-9 are scheduled to enter operation in 2015 and 2017, respectively. These satellites will continue to provide services for the DCS, which plays important roles in collecting meteorological information as well as earthquake and tidal/tsunami data.

In 2014, JMA will revise the related technical requirements to support efficient regional channel usage. The name MTSAT-DCS will also be changed to Himawari-DCS with the operational satellite switch-over in 2015.

JMA has reviewed the technical requirements to support regional channel expansion and effective channel usage at 300 bps.

The Agency plans to allocate its assigned international channels I23-I33 as regional channels, and to narrow down the occupied frequency bandwidth of 300 bps as well as increasing its effective isotropic radiated power (EIRP). The radio frequency channel, EIRP and bandwidth to be used are as follows:

- Radio frequency channel 402.0685-402.4 MHz (100 bps) 402.1-402.4 MHz (300 bps)
- EIRP 43-46 dBm (100 bps) 45 dBm-48 dBm (300 bps)

- Radio signal bandwidth 1.8 kHz (100 bps and 300 bps)

The conditions and required/recommended specifications for the use of MTSAT DCS, along with the relevant request form, can be found at http://www.jma.go.jp/jma/jma-eng/satellite/nmhs/dcp.html

The use of tidal/tsunami DCPs on MTSAT-DCS regional channels has expanded. Statistics on the distribution of tidal/tsunami DCP data via GTS indicates an increasing trend in numbers. In addition to this increase, more frequent collection (from every 15 minutes to every 6 minutes) is being implemented for some tidal/tsunami DCP stations in consultation with the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) to support enhanced monitoring.

In 2014, Padang DCP and Sibolga DCP in Indonesia began operation, and the country's Ambon DCP and Saumlaki DCP have shortened the collection time from every 15 minutes to every 6 minutes.

JMA is receiving more and more requests regarding the use of its MTSAT DCS. Based on the importance of disaster reduction/mitigation activities in the relevant regions and the significant role of the DCS in such work, JMA has responded positively to such requests. Recent instances have been related to:

- Vietnam's plan to install more than 100 hydrometeorological DCP stations for disaster prevention along the Mekong River;
- Fiji's request for a new tidal DCP station;
- A request from France's Service Hydrographique et Océanographique de la Marine (SHOM) for new tidal DCP stations in the Indian Ocean and the western Pacific;
- Requests from the University of Hawaii Sea Level Center (UHSLC) for developments including transition of the use of DCS from Metsat-7 to MTSAT and enhanced data collection periodicity;
- Myanmar's request for a new tidal DCP station

Himawari-8 and -9 will use the Ka band (up to 18 GHz) as the downlink frequency for relaying DCP data, as opposed to the L-band (up to 1.6 GHz) used on the current MTSAT-DCS. To cope with the effects of rain attenuation in the Ka-band, JMA will introduce site diversity with two receiving stations in Tokyo and Hokkaido. As these stations are more than 1,000 km apart, they are unlikely to be affected by heavy rain at the same time. This is expected to guarantee 99.99% uptime in radio communication.

Data transmitted from DCP stations to Himawari-8 are relayed to the Tokyo station and the Hokkaido station before being demodulated. The qualities of data at both stations are compared, and the set with fewer errors is chosen for use. After format conversion, the data are distributed globally via GTS. Along with these distribution efforts, JMA provides online access to the data and an email transmission service as back-up with the aim of creating redundancy in data distribution to users.

WG I expressed its appreciation for the dedicated report provided by JMA and the agreement and support for evaluating the future assignment of the identified 11 international channels.

CGMS-41-ROSHYDROMET-WP-03 addresses the current status and technical specifications of Russian DCS (Electro-L №1). During Electro-L №1 exploitation, DCS proved to be fully functional.

The Russian DCS was established to provide satellite channels for meteorological data transmission from DCPs via meteorological satellites (back-up option – via Luch communication satellites).

The DCS was developed according to the international requirements of WMO and CGMS and has to provide transmission of the messages every 3 hours (standard synoptic hours), and also storm warnings at any time.

The development of the national DCS was started in SRC Planeta in the 1990s. In the absence of national geostationary meteorological satellites (GMS) until 2011 the initial testing and experimental operation of DCS was based on the Meteosat satellite (under the bilateral agreement between ROSHYDROMET and EUMETSAT).

DCP signals are transmitted via dedicated satellite channels at frequency ranges of 401.5-402.5 MHz (uplink) and 1696.5-1697.5 MHz (downlink) with a transmission rate of 100 or 1200 bps. The message size is up to 15 000 bit. The transmission time is synchronised with GLONASS/GPS signals.

System capacity allows data transmission from 300 DCPs simultaneously that provides throughput of 3000 DCPs in 10 minutes.

Russian DCS is developed for data transmission via meteorological satellites: the Electro-L GMS series (constellation of three spacecraft to be located at 76°E, 14.5°W and 166°E), series of Meteor polar-orbiting satellite series (constellation of three spacecraft), Arctica highly elliptical orbit satellite series (constellation of two spacecraft), and Luch geostationary communication satellite series.

The Electro-L GMS constellation (with Luch communication satellites as the back-up option) provides coverage of the territory from about 75°S to about 75°N, the highly elliptical orbit satellites will provide coverage of high Arctic latitudes, and polar-orbiting satellites will cover the regions outside the area mentioned above, but less frequently.

Presently the national DCS is in experimental operation in SRC Planeta based on Electro-L №1 GMS. Messages transmitted from the DCP station to Electro-L №1 are relayed to the European (Moscow region) and Siberian (Novosibirsk) regional centres of SRC Planeta. The deployment of the receiving system in the Far Eastern (Khabarovsk) regional centre is planned for 2015. Then the data will be distributed globally via GTS. In addition, ROSHYDROMET provides an email transmission service for some regional users (regional hydrometeorological administrations).

The number of DCPs has increased significantly over the last two years. Now there are about 420 DCPs allocated (April 2014) transmitting messages via Electro-L №1. DCPs are distributed over the entire territory of Russia, including the remote areas and northern regions with extremely low elevation angles (about 3 degrees) According to the deployment plans, there should be about 800 DCPs installed by the end of 2014. The national DCS currently has a reliability of 99.8 % based on the number of messages successfully received.

WG I thanked ROSHYDROMET for the detailed report and suggested they keep CGMS informed of their continued success.

CGMS-42-NOAA-WP-07 provides a status report on the performance of the International Data Collection System (IDCS) and NOAA's domestic DCS. NOAA's DCS Administration and Data Distribution System (DADDS, serving GOES DCS users) now has almost 1500 individual users, with more than 780 organisations using the system. NOAA has continued to populate user and platform tables, registering and training users, and has now added the task of upgrading browsers. In the past year, it has upgraded operating systems and data base management systems. In the five years since the system has been in operation those features have become outdated and difficult to support. NOAA is contemplating adding a framework system to make browsers easier to maintain and NOAA has begun implementation of new Version 2 transmitters. Implementation of 300 baud transmitters was fairly simple as they could be placed on existing 300 baud channels. However, the 1200 baud channels do not line up with existing channels, and rolling out new channels is more difficult. NOAA recently borrowed a channel from EUMETSAT to accommodate an emergency deployment of new 1200 baud transmitters. The ultimate goal is to relocate the 1200 baud channels to the lower end of the spectrum, where channels have almost been vacated by 100 baud transmitters. The transition to high data rate (HDR) is officially complete with approximately 100 of the 24,800 platforms that are active reporting at 100 bits/sec. NOAA has communicated with owners of the platforms still operating to arrange termination.

NOAA plans to continue to investigate the use of two way communications to better command and control platforms but has continued to focus on higher priority items. NOAA is proceeding slowly with this project, since most resources are being committed to DADDS and Version 2 HDR transmitter implementation. Use of the international channels is minimal.

NOAA is using the channels assigned to us for our domestic use by CGMS, and has already made assignments on all of them. A fully redundant back-up system has been located in Suitland, Maryland, since 2010, and is being fully utilised by users and by developers who continue to roll out enhancements to DADDS by testing them at the Suitland site first. Use of the GOES DCS continues to flourish in the US. The POES DCS (aka Argos) has 21000 active platforms, supporting 1900 users in 118 countries. The Argos space segment currently consists of NOAA-15/16/18/19, Metop-A/B, and SARAL. Future launches include Metop-C (2018) and Metop-SG-B1 (2022) by EUMETSAT, with additional launches by NOAA also planned – but pending Congressional appropriations.

Interference from "Ionospheric Scintillation" from Solar Activity

Near the end of 2011 NOAA began noticing interference with transmissions from a small number of platforms, primarily those near the North and South Poles (Canada and South America.) The data losses were not widespread, but instead seemed to be constrained to small areas, narrow time frames and specific platforms. After much investigation it was concluded that the interference coincided with increased solar activity. This pattern seemed to be traced to a phenomenon called "ionospheric scintillation", an ionisation of a specific layer of the ionosphere that causes refraction and diffraction of radio waves. The pattern has also been tied to GPS interference. Solar activity has continued to increase. While NOAA has continued to monitor this activity, and to understand it a little more, we have made little progress in finding ways to mitigate it. The solar activity is expected to peak in early 2014, so there is not enough time to have an impact on this cycle. There appears to be less impact, and it is hoped this peak is diminishing. NOAA will continue to study this event, with the aim to be prepared to respond to the next cycle, expected in about nine years.

STATUS OF IDCS

No new assignments have been made in the last year. Current allocations include:

Current IDCS allocations											
New international channels	224	226	228	230	232	234	236	238	240	242	244
Channel #	01	02	03	04	05	06	07	08	09	10	11
# of PLT(s)	0	0	0	1	1	0	0	0	4	0	0

A query of the DADDS message table showed no transmissions from any of these platforms.

INTERFERENCE TO THE IDCS

Due to the current limited use of the IDCS, no monitoring is performed. If the usage expands NOAA's DADDS provides tools to make it easier to monitor interference.

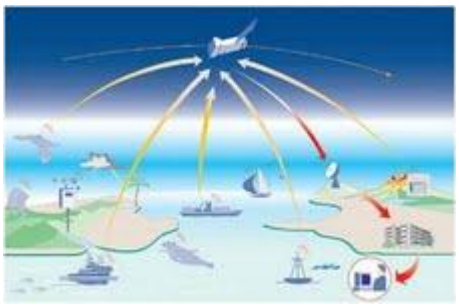
CONSOLIDATED LIST OF IDCS ALLOCATIONS

There have been no new allocations of IDCPs within the past year.

Status of the Argos Data Collection System

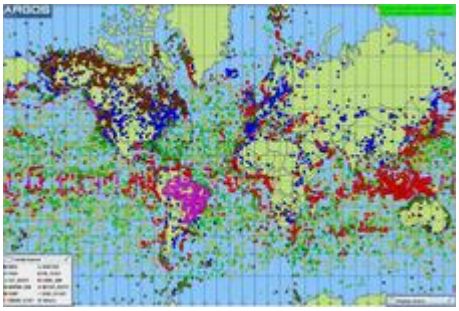
The Argos Data Collection and Location System (DCS) provides global coverage and platform location for government and non-profit agencies with system use agreements (which are reviewed and approved by CNES and NOAA), and for non-government organizations with a vested government interest. The Argos programme is administered under a joint agreement between the National Oceanic and Atmospheric Administration (NOAA) and the French Space Agency, Centre National d'Etudes Spatiales (CNES). Additional partners include EUMETSAT and the Indian Space Research Organisation (ISRO).

The system consists of in-situ data collection platforms equipped with sensors and transmitters and Argos instruments aboard NOAA, EUMETSAT, and ISRO polar-orbiting satellites. The global environmental data sets are collected at telemetry ground stations in Alaska, Virginia, Norway and Antarctica; and pre-processed by the National Environmental Satellite, Data, and Information Service (NESDIS) in Suitland, Maryland. Regional data sets are collected via a global network of HRPT stations. Two CNES subsidiary companies, Collecte Localisation Satellites (CLS) in France and CLS America in Maryland process the data and deliver it to users (and for met-ocean data, post it to the GTS).



Flying the Argos system aboard polar-orbiting satellites provides worldwide coverage. Additionally, incorporating the Argos instrument on a moving satellite allows a platform to be located using Doppler shift calculations. This positioning capability permits applications such as monitoring drifting ocean buoys, wildlife migrations, and commercial fishing vessels, among many others.

There are currently more than 21,000 active Argos Platforms being tracked by over 1,900 users in 118 countries. Argos use has steadily risen since its inception over 30 years ago, and especially in the last decade (subject to seasonal variation). The data latency requirement for the system is 60-minutes, with 30-minutes strongly preferred. This is achieved by a robust spacecraft constellation and ground system.



Frequency uses include: Platforms to spacecraft – 401.65 MHz; spacecraft to platforms (for Metop-A and SARAL with operational Argos-3 instruments) – 465.9875 MHz; and spacecraft to ground stations – 1695-1710 MHz. Future use of 399.9-400.05 MHz is anticipated for a small number of non-environmental applications, beginning with NOAA's next Argos mission (TBD), with the first Argos-4 instrument.

CGMS-42-EUM-WP-20 presented an overview of the work performed on behalf of CGMS in the SATCOM Forum in the context of Data Collection Systems. The meeting discussed WMO/IOC user requirements for remote automatic weather stations, hydrological stations, polar observations, drifting buoys, ship-based observations, sea-level observations, ARGO profilers and animal trackers.

Overall there was agreement that such a Forum would benefit the existing user community, but could also provide a 'one-stop-shop' for new users who wish to collect data from remote sites.
The information about the Data Collection Systems of CGMS members will be collected and made available to existing and potential end users via the SATCOM Forum.

In addition to the usual information provided by agencies at each CGMS meeting, the ad-hoc meeting also proposed the following useful Satcom criteria and draft metrics:

This list of criteria which may be described in tables published by the Satcom Forum gives 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 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.

The first SATCOM Forum is planned for 2015.

It was proposed to collate all the current CGMS DCS information, and gather further information, as outlined above, in a single 'manual' in preparation for the next Satcom Forum meeting.

This information will be gathered during the CGMS-42 meeting and in subsequent bilateral discussions with CGMS partners.

CGMS-42 action – WG I						
Actionee	Action	#	Description	Deadline	Status	HLPP ref
EUM	WG I/4	A42.06	EUMETSAT to provide template to report DCP system characteristics by the different DCP operators of CGMS	30 Jun 2014	OPEN	HLPP# 1.2
CGMS DCP operators	WG I/4	A42.07	CGMS DCP operators to provide DCP system characteristics (in the template form provided by EUMETSAT in previous action) in support of the preparation activities for the Satcom Forum in 2015	30 Sep 2014	OPEN	HLPP# 1.2.1

WG I/5 Regional Retransmission Services (RARS) including support for NPP and Metop

CGMS-42-EUM-WP-17 presents an overview of the elements of Regional Services for the polar orbiting satellites, summarises experiences gained throughout the operation and development of

Regional Services at EUMETSAT and NOAA, and discusses elements that could be considered for coordination through CGMS.

The aim is to achieve a coordinated and consistent set of Regional Services, while leaving room for diversity in the regional implementations, operations concepts and set of services offered.

The availability of mature and well supported product processing software is essential for providing Regional Services of a high operational quality, and this software shall be provided by the agencies operating polar-orbiting satellites, together with appropriate user support functions.

While different internal architectures of Regional Services may exist, CGMS is encouraged to evaluate and document commonalities and best practices in the organisation and architecture of Regional Services.

To facilitate the setup of new Regional Services and to promote the exchange of data between multiple Regional Services, it is recommended that the interfaces between the different elements are standardised, specifically:

- The interface between the direct broadcast reception station and the Regional Service;
- The interface for retrieving auxiliary data required for product processing;
- The interface and product formats for distributing products to users;
- The inter-regional interface for exchanging products, scheduling and monitoring data between the Regional Services.

Additionally, consistent and comprehensive documentation for the space to ground interface is essential for the success of establishing direct broadcast reception stations.

CGMS-42 recommendation – WG I						
Actionee	Rec	#	Description	Deadline	Status	HLPP ref
CGMS space agencies (with LEO spacecraft)	WG I/5	R42.03	All agencies operating polar orbiting satellites to provide, whenever relevant for operational meteorology, a package based on the core software from the global processing for use in local and regional product processing, in particular level-1 processing; considering that: • the software is executable on a standard computer platform, typically Linux/x86-64; • the software uses parallelisation techniques making efficient use of modern multi-core computers for the sake of timeliness; • updates to the software and its configuration data are provided via	(CGMS-43)	OPEN	HLPP# 1.4.4

			the Internet for maintaining consistency with the global products throughout the lifetime of the mission; • complete and comprehensive user documentation is supplied.			
CGMS members	WG I/5	R42.04	Each agency providing product processing packages to implement a user support function supporting the software release process, the software installation and anomaly resolution.	(CGMS-43)	OPEN	HLPP# 1.4.4
CGMS members	WG I/5	R42.05	CGMS to consider further actions to evaluate and document commonalities and best practices in organisation and architecture of Regional Services.	(CGMS-43)	OPEN	HLPP# 1.4.5
CGMS members	WG I/5	R42.06	Agencies to provide a complete and comprehensive Space to Ground Interface Control Document for each satellite family, defining the radio frequency encoding and data layout of the direct broadcast downlink.	(CGMS-43)	OPEN	HLPP# 1.4.2
CGMS members	WG I/5	R42.07	CGMS to promote standardisation of the data interface between the direct broadcast reception station and the product processing software.	(CGMS-43)	OPEN	HLPP# 1.4.5
CGMS members	WG I/5	R42.08	CGMS to promote standardisation of the pass scheduling interface between the Regional Service and the direct broadcast reception station.	(CGMS-43)	OPEN	HLPP# 1.4.5
CGMS space agencies (with LEO spacecraft)	WG I/5	R42.09	All agencies operating polar orbiting satellites to provide product processing auxiliary data via the Internet.	(CGMS-43)	OPEN	HLPP# 1.4.5
CGMS members	WG I/5	R42.10	CGMS to consider further actions on standardising the interregional interfaces for exchange of products, pass scheduling, monitoring and other information.	(CGMS-43)	OPEN	HLPP# 1.4.5

CGMS-42-EUMETSAT-WP-18 presents the approach taken by EUMETSAT for developing a Regional Advanced Retransmission Service (RARS) in Africa. The document provides a brief summary of the overall RARS status and discusses the rationale for developing a RARS network in Africa. In addition, this working paper provides an explanation of the concept which is currently being discussed with the partners in Africa, and the potential donors. EUMETSAT defined an approach aiming at implementing several RARS stations in Africa that would ensure full coverage of the region.

This approach includes:

1. a preliminary design of an African RARS network that would be operated independently of the EUMETSAT RARS (EARS) network; and
2. interactions with potential donors (mainly the European Commission) to mobilise funds to support the implementation of such a project.

In parallel to the technical discussions, EUMETSAT and the WMO approached the European Commission to mobilise funding, through the European Development Fund, to support the implementation of the proposed RARS network.

The tentative schedule for the implementation of this activity is as follows:
- consolidation of the approach with African partners by mid-2014;
- confirmation of availability of funding by autumn 2014; and
- start of implementation of the RARS Africa project in 2015 for a 4-year period.

CGMS-42-WMO-WP-19 provides an update on the Regional ATOVS Retransmission Services (RARS) concept, the RARS network status, and the procedures – including for example pre-processing software harmonisation, quality monitoring, and coding convention – adopted to ensure consistency of RARS products. Several new RARS stations are being included in the RARS/ATOVS network, namely in Tahiti, Chennai, and New Delhi, with plans for Easter Island, which will significantly improve coverage over the Pacific Ocean in particular. RARS is increasingly recognised as a valuable model for near real-time access to LEO data.

RARS is evolving into a new system, named “Direct Readout, Acquisition and Relay of Satellite Data” (DRARS), with two major developments: the inclusion of data products from advanced sounders such as CrIS and IASI, and convergence with the NOAA Direct Broadcast Real Time Network (DBRTN) for NPP and JPSS. These major developments will be reflected in a new Guide on DRARS to be developed as part of the WMO Information System (WIS) documentation, replacing the current RARS Operators Standards.

The 19th International TOVS Study Conference (ITSC-19) expressed strong support for these developments from a user viewpoint. It invited WMO to reactivate the CGMS-WMO RARS Implementation Group and recommended “that the Space Science Engineering Centre (Univ. Wisconsin), NOAA, EUMETSAT, and WMO coordinate on data formats, software versions, and latency requirements and come up with a plan to include the DBRTN products in RARS”.

The following action was therefore raised:

CGMS-42 recommendation – WG I						
Actionee	Rec	#	Description	Deadline	Status	HLPP ref
CGMS space agencies (with LEO spacecraft)	WG I/5	R42.11	CGMS Satellite operators to support the definition and implementation of community agreed operational procedures for LEO satellite data direct read-out, acquisition, and relay in the context of the DRARS Implementation Group.	(CGMS-43)	OPEN	HLPP# 1.4.5

All these aspects are considered by WG I to fall under the assigned responsibilities of this specific CGMS WG and the revision of the HLPP shall ensure that the proposals made by the different working papers submitted to CGMS-42 on this specific subject are properly taken care of and adequately handled via dedicated inter-sessional meetings.

However, in order to achieve that, it is necessary to recall that CGMS-41 WG I action 41.17 "*CGMS members to nominate representatives in the Task Team to work on RARS related aspects*" is still open and a new date was proposed (15 June 2014) to allow adequate representation in the Inter-Sessional meetings to work on the identification and consolidation of best practices for Regional Services (RARS based) using LEO satellites. The participants identified in the WG I Inter-Sessional meetings are also expected to be part of the requested WMO DRARS Implementation Group.

WG I/6 Review and updating of the HLPP

The WG considered the status of implementation of the High-Level Priority Plan (HLPP), and while appreciating the overall progress, did not identify priorities within its area of focus that can be considered achieved at this point in time.

Following detailed discussions on the planned evolution of the RARS systems, the WG proposed the following priority for inclusion in the new version of the HLPP: Make available pre-processing S/W packages for generation of L1 products from LEO Direct Broadcast

With this amendment, the WG recommended to the CGMS plenary the proposal for an updated High-Level Priority Plan.

WG I/7 Any other business

There was no other business discussed.

WG I/8 Planning of inter-sessional activities/meetings [CGMS-42 - CGMS-43]

Four groups of Inter-sessional meetings were agreed by WG I:

WG I.IS-1: The first group of inter-sessional meetings will be dedicated to Section 2.6 (Global Specs) of the HLPP and will be held on a quarterly basis, starting in mid-September 2014;

WG I.IS-2: The second group of inter-sessional meetings will be dedicated to Section 1.4.5 (RARS) of the HLPP of relevance to WG I (i.e. RARS related activities) and will be held on a quarterly basis, starting mid-August 2014;

WG I.IS-3: The third group of inter-sessional meetings will be dedicated to Section 1.2 (DCS) of the HLPP and will also meet on a quarterly basis, starting in early October 2014; and

WG I.IS-4: The fourth group of inter-sessional meetings will be dedicated to Sections 1.4.3 (user stations) and 1.3 (frequency coordination topics) of the HLPP and will also meet on a quarterly basis, starting in early September 2014.

WG I/9 Review of actions, conclusions, preparation of WG report for the plenary

The final list of WG I actions and recommendations resulting from CGMS-42 deliberations is available here.