

WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR BASIC SYSTEMS STEERING GROUP ON RADIO FREQUENCY COORDINATION (SG-RFC)

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Subject: Contribution to the Radio Spectrum Policy Group (RSPG) public consultation on "A coordinated EU spectrum approach for scientific use of radio spectrum"

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1 Introduction

The World Meteorological Organisation (WMO) would like to thank the EU RSPG for the opportunity to comment on the current report on "**A coordinated EU spectrum approach for scientific use of radio spectrum**" issued on 15 May 2006.

By this document, WMO would like to provide comments to this Report and also emphasise the critical importance of Radio-frequencies for the whole meteorological community.

2 Importance of radio-frequencies for the meteorological community

Radio-frequencies represent scarce and key resources for the meteorological community, organised within WMO, to produce and collect the observation data upon which predictions and warnings are processed, and to disseminate weather, water and climate information and early warnings to various economic sectors and the public. It should also be understood that all related frequency applications are inter-dependent and represent a global meteorological system.

Among these radio-frequency applications, satellite passive sensing represents a very specific application on both a technical (due to the interference susceptibility of the highly sensitive passive sensors) and a regulatory basis (through proposed exceptions to the provisions of RR footnote **5.340**) that is increasingly threatened by interference from active radiocommunication applications.

Spaceborne passive sensing of the Earth's surface and atmosphere has an essential role and an increasing importance in both operational and research meteorology, in particular for mitigation of weather and climate-related disasters, and in the scientific understanding, monitoring and prediction of climate change and its impacts. The impressive progress made in the recent years in weather and climate analysis and forecasts, including warnings for dangerous weather phenomena (heavy rain, storms, cyclones) that affect all populations and economies, is to a great extent attributable to spaceborne observations and their assimilation into numerical models.

Space-borne passive sensing for meteorological applications is performed in bands allocated to the Earth exploration-satellite (passive) and meteorological satellite service. Passive sensing requires the measurement of naturally-occurring radiations, usually of very low power levels, which contain essential information on the physical process under investigation.

The relevant frequency bands are mainly determined by fixed physical properties (e.g. molecular resonance). The properties cannot be changed or ignored. These frequency bands are, therefore, an important natural resource. Even low levels of interference received at the input of the passive sensors may degrade passive sensor operations. In addition, in most cases the sensors are not able to discriminate between these natural radiations and man-made radiations. In this respect, RR footnote **5.340** enables the passive services to deploy and operate their systems in the most critical passive-sensing frequency bands.

It should be stressed that bands below 100 GHz are of particular importance, as they provide an “all-weather” capability since clouds are nearly transparent at these frequencies.

Several geophysical parameters contribute, at varying levels, to natural emissions, which can be observed at a given frequency that present unique properties. Therefore, measurements at several frequencies in the microwave spectrum must be made simultaneously in order to isolate and to retrieve each individual contribution, and to extract the parameters of interest from the given set of measurements.

As a consequence, interference that could impact a given “passive” frequency band could thus have a negative impact on the overall measurement of several atmospheric component.

Therefore, passive frequency bands cannot be considered on their own. Rather, they should be viewed as a complete system. Current scientific and meteorological satellite payloads are not dedicated to one given band but include many different instruments performing measurements in the entire set of passive bands.

Also, meteorological radars as well as wind-profiler radars perform an important part in the meteorological observation processes. Radar data are input to the Numerical Weather Models either for nowcasting (i.e. immediate early warnings) or short-term and medium-term forecasting. Currently on a worldwide basis, there are hundred of wind-profiler radars and several hundred meteorological radars that perform precipitation and wind measurements and that play a crucial role in the immediate meteorological and hydrological alert processes. Meteorological radar networks represent the first line of defence and prevention against loss of life and property in flash floods, severe storms events and tropical cyclones such as recently in Louisiana (US) with the Hurricane Katrina, in Boscastle (UK), and in several cases in south of France.

Also of great importance is the availability of sufficient and well-protected frequency spectrum for telemetry/telecommand as well as for the downlink of the collected data from the Earth exploration and meteorological satellites.

Last but not least, radiosondes operating in the 400 MHz and 1680 MHz bands also represent important radio applications for the meteorological and climate community providing in situ atmospheric measurements performed by about 900 stations worldwide and representing more than 1 million launches per year. These in-situ measurements provide crucial data for all meteorology and climate operations and research, as well as for calibrating satellite-based passive and active measurements.

It should be noted that the Fourteenth World Meteorological Congress (Geneva, May 2003), attended by 170 Member countries, amongst them all European Union countries, expressed its serious concern at the continuous threat to radio frequency bands allocated for meteorological and related environmental systems and adopted Resolution 3 (Cg-XIV) – *Radio frequencies for meteorological and related environmental activities* – in which the 187 WMO Member countries are urged to make all efforts to do their utmost to ensure the availability and protection of suitable radio frequency bands required for meteorological and related environmental operations and research.

Radio-frequencies represent scarce and key resources for the meteorological community to produce and collect the observation data upon which predictions and warnings are processed, and to disseminate weather, water and climate information and early warnings to the various economic sectors and the public. It should be understood that all related frequency applications are interdependent and represent a global meteorological system, already harmonised and coordinated with 187 Member countries under the WMO auspices.

WMO hence stresses the fact that a lack of any of this system's radio components, either related to observation or data dissemination, would put at risk the whole meteorological process and operation; This is the reason why the 187 WMO Member countries, as expressed in the attached Resolution 3 (Cg-XIV), appealed to the International Telecommunication Union and its Member Administrations:

- **to ensure the availability and absolute protection of the radio-frequency bands which, due to their special physical characteristics, are a unique natural resource for spaceborne passive sensing of the atmosphere and the Earth surface,**
- **to give due consideration to the WMO requirements for radio frequency allocations and regulatory provisions for meteorological and related environmental operations and research**

3 WMO Comments to the RSPG public consultation

The World Meteorological Organisation (WMO) welcomes the RSPG initiative toward a RSPG opinion on a “coordinated EU spectrum approach for scientific use of radio spectrum” and the related Report in public consultation and believes it currently reflects the overall importance of meteorological services and raises the most important points, societal as well as economic value of meteorological services, international governmental commitments through the WMO World Weather Watch and recognition of the essential passive bands covered by RR footnote **5.340**.

WMO note with interest the reference made to the WMO Resolution 3 (Cg-XIV) – *Radio frequencies for meteorological and related environmental activities* – and would like to insist on the fact that this Resolution represent the view of the 187 WMO Members, among of which the 25 European Union Members.

In particular, this Resolution appeals to the International Telecommunication Union and its Member Administrations:

- to ensure the availability and absolute protection of the radio-frequency bands which, due to their special physical characteristics, are a unique natural resource for spaceborne passive sensing of the atmosphere and the Earth surface,
- to give due consideration to the WMO requirements for radio frequency allocations and regulatory provisions for meteorological and related environmental operations and research

Recognising the importance taken by the European Commission in frequency management issues, the WMO would also hence like to consistently appeal the European Commission toward the same consideration and to support the positions expressed by its Members within WMO.

In particular, even though meteorological radio applications encompass a large variety of radio services, the specific case of frequency bands covered by RR footnote **5.340** needs to be stressed as they represent unique natural resources that cannot be put at risk.

From the WMO prospective, passive bands covered by RR footnote **5.340** cannot be shared and shall remain as bands where “all emissions are prohibited”. To that respect, WMO notes with interest item 5 of section 9 that requests Member states to comply with their obligations and considers that assessment process in view of improving sharing as described in item 7 clearly does not apply to bands covered by RR footnote **5.340**.

In particular, WMO would like to highlight the Commission Decision 2005/50/EC of 17 January 2005 on “*the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the community*” and its considering (24) :

“The temporary introduction of automotive short-range radar in the 24 GHz range radio spectrum band has an exceptional character and must not be considered as a precedent for the possible introduction of other applications in the bands where ITU Radio Regulations footnote 5.340 applies, be it for temporary or permanent use.”

In conclusion, the World Meteorological Organisation, consistently with the current Report, is in favour of the adoption of a RSPG opinion on “*a coordinated EU spectrum approach for scientific use of radio spectrum*” that would recognise, in particular, the current and increasing importance of weather, water and climate activities, including multi-hazard early warnings and safety of life implications, and the high dependency of these activities on radio-frequencies, either active or passive, that cannot be put at risk and hence the need for a clear political framework and guideline among European Union Members and the European Commission.
