|  |  |
| --- | --- |
| **World Meteorological Organization****Commission for Instruments and Methods of Observation** **CIMO Management Group** **Fifteenth Session**Geneva, Switzerland, 26 – 29 March 2018 | **CIMO/MG-15/Doc. 2.3(3)**  |
| Submitted by:Ercan Büyükbaş24.03.2018 |

#

# Report on progress, recommendations and future activities of Theme Leader on Radio-frequency Protection

|  |
| --- |
| **Summary and purpose of document**This document provides information on the progress of tasks assigned to the Theme Leaders on Radio-Frequency Protection, identifies the achievements and problems encountered and provides recommendations for consideration by CIMO MG-15. |

**Action proposed**

The Meeting is invited to review this report and to comment on the issues regarding the frequency protection, and to consider the guidance for the protection of observing systems against wind farms.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Appendices:** I [Updated Workplan](#Appendix1)

 II [Additional Information](#Appendix2)

 III [Topics and deliverables for after CIMO-17](#Appendix3)

**EXECUTIVE SUMMARY**

* During CIMO-MG-13, the workplan has been approved, and 5 main tasks have been assigned to Theme Leader on Radio-Frequency Protection.
* In accordance with the first three tasks in the workplan, an active participation to the activities of Steering Group on Radio-Frequency Coordination (SG-RFC) has been provided the cooperating with related expert teams and task teams and by contributing preparation of the WMO position document for the World Radiocommunication Conference (WRC) to be held in 2019 as WRC-19.
* The document related to radio frequency issues prepared by SG-RFC reflects the preliminary WMO position on the agenda of the WRC-19 by highlighting the requirements and importance of radio spectrum for meteorological operations.
* Although there is a statement in the SG-RFC document for the protection of the frequencies used for radiosonde operations, bandwidth requirements for Global Radiosonde Operations should be studied in detail, and a report should be prepared. By considering the fact that SG-RFC members may not have the radiosonde network operational details to determine the spectrum requirements, required information should be provided by the related CIMO expert team/theme leader to SG-RFC which can use to address WRC-19 Agenda Item 1.7.
* The forth task for sharing arrangements for HF oceanographic radars was completed.
* Fifth task requires the update of the guidance material to avoid/minimize the wind turbines effects to the weather radars and wind profilers. Although a guidance statement is available for weather radars and wind turbine siting in CIMO Guide, it should be reviewed and updated based on the feedback from the Members and related experts. The IPET-OWR will take over the task for wind turbine issues for weather radars, but this important task, in particular for wind profiler radars, should be considered how to carry out for next intersessional period by CIMO-MG and CIMO-17.
* By considering the importance of the radio frequencies for meteorological operations, high priority should be given to radio frequency protection issue by CIMO-MG and CIMO-17.

**REPORT ON ACHIEVEMENTS, RECOMMENDATIONS AND FUTURE ACTIVITIES OF CIMO THEME LEADER ON RADIO-FREQUENCY PROTECTION**

*(based on the input provided by Theme Leader)*

1. ***Major achievements with respect to Workplan***
	1. Theme Leader, Mr. David Franc, has provided the input of CIMO for the preparation of the document prepared by SG-RFC to reflect the WMO position for the related agenda items of WRC-19 to state the frequencies used for meteorological operations, and to highlight the importance of such frequencies, and to avoid any new frequency allocations for third parties or other operations in the same frequency band to be able protect the frequencies used by meteorological services.
	2. It was noted in SG-RFC document that twelve of WRC-19 agenda items (1.1, 1.2, 1.3, 1.6, 1.7, 1.13, 1.14, 1.15, 1.16, 9.1.5, 9.1.9, 10) are related to frequency bands or issues of prime interest or concern for meteorology and the related fields. In addition, there are also nine WRC-19 agenda items (1.11, 1.12, 2, 4, 7, 9.1.4, 9.1.6, 9.1.7, 9.1.8) that are currently not involving specific frequency bands used for meteorological operations but that may potentially have an impact on WMO interests. SG-RFC made its assessment on the WRC agenda items by considering their potential positive or negative effect on development and operation of meteorological systems and applications.
	3. Sharing arrangements for HF oceanographic radars was completed. The frequency allocations have been agreed at WRC-12 (2012 World Radiocommunication Conference) and the ITU-R published a report on techniques for sharing spectrum between the radars in 2014.
2. ***Problems encountered***
	1. There was no regular feedback regarding the activities and achievements by Theme Leaders.
	2. The expert assigned for carrying out some tasks, Mr Oguzhan Şireci, resigned from his agency, Turkish State Meteorological Service, and the expected contribution could not be provided by him.
3. ***Recommendations***
	1. The Theme Leaders should be supported by assigning more experts for carrying out the tasks.
	2. A proper communication mechanism and a template for reporting by Theme Leader may be beneficial for monitoring the activities and reaching the achievements.
	3. Required information on the operational need for the frequencies used by radiosonde observations should be submitted to SG-RFC by related CIMO ET/TL. Then SG-RFC can improve the WMO position paper for WRC-19, in particular for Agenda Item 1.7.
	4. Wind turbines issue for wind profiler radars can be considered under the tasks of ET-ORST. Improvement of existing guidance statement and preparation of a regulatory material should be also considered in cooperation with IPET-OWR.
4. ***Major topics for future work with expected associated deliverables***
	1. Protection of existing radio frequencies and future requirements for radio frequencies for meteorological operations.
	2. Avoiding and minimizing the radio frequency problems encountered by meteorological services. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**APPENDIX I**

**UPDATED WORKPLAN**

**Workplan of the Theme Leaders on Radio Frequency Protection (2014-2018)**(Version: as approved by CIMO-MG-13 in Dec. 2014)

| **No.** | **Task description** | **Person responsible** | **Action** | **Deliverable** | **Deadline for deliv.** | **Status****[%]** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | **Liaison with CIMO ETs and TLs on radiofrequency issues** | **Sireci/****Franc** | 1. Advise CIMO ETs/TTs/TLs on issues that should be addressed with respect to radiofrequency coordination (review SG-RFC reports and convey relevant parts to CIMO ETs and OPAG Chairs)
2. Coordinate investigations within CIMO, as required, to assist the work of SG-RFC.
3. Develop a listing of observing systems, the radio-frequency bands on which they rely and the tolerable levels of interference which they can withstand.
 | 1. Document with advice to CIMO on current RF issues. 2. CIMO expert input into the work of CBS SG-RFC 6. Listing of R/F susceptibility of different observing systems.3. Guidance documentation for Members’ RF experts. | Yearly, following SG-RFC meetingYearly, in due time for timely subm. To SG-RFC11/2015 |  | CIMO MG-11 |
| 2. | **Represent CIMO in CBS SG-RFC activities** | **Sireci/****Franc** | 1. As far as possible, attend SG-RFC meeting and represent CIMO therein
2. Gather issues regarding radiofrequency from CIMO ETs/TTs/TLs and forward relevant issues of concern from CIMO to SG-RFC
3. Contribute to the activities of SG-RFC, especially, by providing CIMO input to the WMO position paper for WRC.
 | 1. Document/mail sent to SG-RFC chair
2. a) Reports to SG-RFC
3. b) Report to OPAG Chair
 | YearlyYearlyOngoing |  | CIMO-16, Doc. 5, §5.27 |
| 3 | **Bandwidth Requirements for Global Radiosonde Operations** | **Sireci**Franc | Work with CBS in ascertaining minimum bandwidth continuance of global radiosonde operations in this band. | Draft IOM Report | 11/2015 |  | In collaboration with CBS |
| 4 | **Sharing arrangements for HF oceanographic radars** | **Franc**Sireci | Work with CBS and JCOMM to develop a sharing plan for HF oceanographic radars | Draft IOM Report | 11/2016 |  | Documented by ITU-R |
| ~~5~~ | **~~Protecting Radar Operations from Wind Farms~~** | **~~Franc~~** ~~Sireci~~ | ~~Update regulatory/guidance material regarding wind turbine siting close to weather radars and wind profilers~~ | ~~Update to WIGOS Manual / CIMO Guide~~ | ~~06/2017~~ |  | ~~Refer to Eumetnet OPERA study~~~~Also refer to ICAO actions..~~ |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**APPENDIX II**

**ADDITIONAL INFORMATION (if needed)**

* + - 1. The online version of approved document prepared by SG-RFC is available in the link below:

[http://wis.wmo.int/file=3379](http://wis.wmo.int/file%3D3379)

It was reported in the document that, among WRC-19 agenda items, twelve items are related to frequency bands or issues of prime interest or concern for meteorology and the related fields. These agenda items are stated below:

Agenda item 1.1 : Amateur service in the 50-54 MHz band

Agenda item 1.2 : Satellite hard limits at 400 MHz

Agenda item 1.3 : Meteorological Satellite (MetSat) and Earth Exploration Satellite Service (EESS) at 460-470 MHz

Agenda item 1.6 : Non Geostationary Satellite Orbit (GSO) of the Fixed Satellite Service (FSS) at 37.5-51.4 GHz

Agenda item 1.7 : Non GSO satellites with short duration missions

Agenda item 1.13 : International Mobile Telecommunication 2020 (IMT2020)

Agenda item 1.14 : High Altitude Platforms (HAPS)

Agenda item 1.15 : Fixed Service (FS) and Land Mobile Service (LMS) above 275 GHz

Agenda item 1.16 : Radio Local Area Network (RLAN) 5 GHz

Agenda item 9.1.5 : RLAN 5 GHz and reference to radar ITU-R recommendations

Agenda item 9.1.9 : FSS at 51.4-52.4 GHz

Agenda item 10 : Agenda for next WRCs

It was also noted in the document that there are also nine WRC-19 agenda items (1.11, 1.12, 2, 4, 7, 9.1.4, 9.1.6, 9.1.7, 9.1.8) that are currently not involving specific frequency bands used for meteorological operations but that may potentially have an impact on WMO interests.

* + - 1. The new edition (2017) of the *“Handbook on Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction”* is available in the link below: <https://library.wmo.int/opac/doc_num.php?explnum_id=3793>
			2. For frequency allocation for HF marine radar is available in the document in the link below:

<https://www.itu.int/pub/publications.aspx?lang=en&parent=R-REP-M.2321-2014>.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**APPENDIX III**

**APPENDIX III: Draft workplan for after CIMO-17**(Note: do not fill in colums Person Responsible/Deadline/Status)

| **No.** | **Task description** | **Person responsible** | **Action** | **Deliverable** | **Deadline for deliv.** | **Status****[%]** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | **Liaison with all related entities on radiofrequency issues** |  | 1. Advise CIMO ETs/TTs/TLs on issues that should be addressed with respect to radiofrequency coordination (review SG-RFC reports and convey relevant parts to CIMO ETs and OPAG Chairs)
2. Contribute the SG-RFC activities by providing input from CIMO perspective.
 | 1. Document with advice to CIMO on current RF issues. 2. SG-RFC report with input from CIMO |  |  |  |
| 2. | **Prepare a report on the existing radio frequencies used for meteorological services, and the frequency requirements for future operations, in particular for newly developed remote sensing systems** |  | * + - 1. Develop a list of observing systems and the radio frequencies they use
			2. Analysis the radio frequency requirements for existing and future systems
 | 1. 1. A list of radio frequencies for observing systems including radio frequency susceptibility of different observing systems
2. 2. A report on the future needs for radio frequencies
 |  |  |  |
| 3. | **Prepare a report on the problems encountered regarding the radio frequencies**  |  | 1. Make a survey to collect the information of radio frequency problems for meteorological operations
2. Develop guidance in cooperation with CBS and related ETs/TTs and TLs to overcome those problems
 | 1. A report on the radio frequency problems2. A guidance document for the users |  |  |  |
| 4. | **Bandwidth Requirements for Global Radiosonde Operations** |  | Work with CBS and related CIMO ET/TL in ascertaining minimum bandwidth continuance of global radiosonde operations in this band. | Draft IOM Report |  |  |  |
| 5. |  |  |  |  |  |  |  |
| 6. |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |
| 8. |  |  |  |  |  |  |  |
| 9. |  |  |  |  |  |  |  |
| 10. |  |  |  |  |  |  |  |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_