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| **World Meteorological Organization****Commission for Instruments and Methods of Observation OPAG on Remote-Sensing Technologies****Inter-Programme Expert Team on Operational Weather Radars**Tokyo, Japan, 13-16 March 2017 | **CIMO/OPAG-RST/IPET-OWR-1/Doc. 5.2(3)**  |
| Submitted by:Ercan Büyükbaş, Turkey06.03.2017**DRAFT 1** |

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### WMO Radar Database and WIGOS OSCAR/Surface

### SUMMARY

This document provides information on latest status and operational use of the WMO Radar Database (WRD) developed and maintained by Turkish State Meteorological Service in cooperation with of WMO as a joint task of CIMO and CBS.

The document provides information also on the relation with WRD and WIGOS OSCAR/Surface, which is developed and maintained by MeteoSwiss on behalf of WMO as the official repository of metadata on surface-based meteorological and climatological observations that are required for international exchange.

### DECISIONS/ACTIONS REQUIRED: Proposed decisions and recommendations have been stated in part 1.

### ISSUES TO BE DISCUSSED: The issues to be discussed have been stated in part 2.

### REFERENCES: Related documents and web sites have been stated in part 3.

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* + - 1. **WMO RADAR DATABASE**
	1. The development process of the WRD was started in 2009 as joint task of CIMO and CBS expert teams to establish a web based platform for collecting, archiving, monitoring and updating of the metadata of the weather radars used by the Members. The WRD developed by Turkish State Meteorological Service (TSMS) is under operation and open for the use of the Members since 2011.
	2. A lot of information such as owner, manufacturer, and location, operational and technical features on the radars are available in WRD for the use of the Members.
	3. As it can easily be seen from the tables below that there is getting increased interest to WRD by the Members. While the number of the Members registering in WRD was 49 in 2009, the registered Members providing the radar information into WRD in 2017 has reached to a number of 88. On the other hand, while the total number of weather radars registered in WRD in 2009 was 464, the metadata of the 926 weather radars are available in WRD as of 2017 March. Moreover, the number focal points nominated by the Members was 23 by 2011, but WRD has 75 focal points, as of 2017 March, to carry out the required tasks for the efficient use and operation of the system.

*Figure 1. Number of Weather Radars Registered in WRD by the Members*

*Figure 2. Number of Members Providing Information for WRD*

*Figure 3. Regional Distribution of Members Providing Information for WRD*

 *Figure 4. Distribution of Radar Frequencies Registered in WRD*

* 1. Although most of the Members operating weather radars have been registered in WRD, it is noted that some Members operating weather radar networks are still missing in WRD. It is expected that the gaps will be filled soon and all Members will be registered in WRD.
	2. In accordance with the decisions and requirements of the related bodies, and the based on the feedback from the users of WRD, an ongoing development and upgrade of WRD with the new features has been under process.
	3. As discussed and required in the joint meeting of CIMO ET-ORS & CBS ET-SBO in October, 2015, new features for online update of the Members information by focal points have been developed and implemented in WRD. The steps of this process will be applied as follows:
1. The focal point will fill the update form.
2. The information provided by this form will be saved as temporary file to the table identical of the table in the main radar database.
3. An e-mail with a message of “ Waiting For Your Confirmation” will be sent for the authorized users to the address of wrdupdate@mgm.gov.tr
4. The users with approval authority will review the update form from the webpage of “Update Radar Database - On-line Confirmation for Admins”.
5. When the user selects the radar to update via “Update” button, an approval page with the following information will come:

a. At the top, the existing unchangeable information in the database to check the update information.

b. At the bottom, the information in the changeable checkboxes submitted by the focal point recorded in the temporary table.

1. The user (Admin) will approve the update if agreed or make the necessary modifications in the related fields, then the update information will be transferred to main database, and archived.
2. After this process, an automatic e-mail including the update information will be sent to the address of wrdupdate@mgm.gov.tr.
	1. The new features and capabilities of WRD will be open to discussion during the CIMO-IPET-OWR meeting. For example, existing and possible future wind turbine installation around the weather radars, radio-frequency interference sources, etc. can be added as templates to fill and report by the Members. It should be considered as one of the tasks for the expert team to be established.
	2. By considering the important benefits of the WRD for the Members, it is recommended that the maintenance and further development of the WRD for hardware and software requirements should be supported by IPET-OWR and the WMO Secretariat.
		* 1. **WIGOS OSCAR/Surface**
	3. OSCAR/Surface, as one of the components of the WIGOS Information Resources (WIR), developed jointly by MeteoSwiss and WMO, and has been launched officially for operational use of the Members on May 2, 2016.
	4. OSCAR/Surface replaces WMO Publication No. 9, Volume A, Observing Stations and the WMO Catalogue of Radiosondes as well as other similar station inventories. In addition, WMO Members can use OSCAR/Surface as their primary national stations database to store and record WIGOS metadata.
	5. Observational metadata, i.e. information on the capabilities of observing stations/platforms and their instruments and methods of observation, should be submitted to and maintained in OSCAR/Surface by WMO Members according to the Technical Regulations described in the WIGOS Manual. Metadata from a number of co-sponsored observing systems are also maintained in OSCAR/Surface.
	6. In accordance with the concept of WIGOS, surface-based remote sensing observing systems including weather radars will be available in OSCAR/Surface.
	7. Currently OSCAR/Surface has been receiving radar metadata from WRD via the template files submitted by WRD. It was noted that a machine to machine (M-2-M) interface between WRD and OSCAR/Surface should be developed and operated.
	8. The issues regarding OSCAR/Surface and WRD have been discussed during the last session of CBS (CBS-16). The importance of the maintenance and further development of the OSCAR was highlighted, and it was recommended that the WMO Secretariat should support this process.
	9. Furthermore, it was recommended by CBS-16 that Members submit to OSCAR all the WIGOS metadata meant for international exchange through the following mechanisms: Directly to OSCAR, preferably through the M-2-M interface as it becomes available, for all relevant WIGOS observing systems they operate, in addition to the following ones: GAWSIS, WMO Weather Radar Database, JCOMMOPS. It is expected from the Members that they should nominate their OSCAR focal points, maintain up-to-date metadata of observing systems in accordance with the WIGOS Metadata Standard, and provide these to OSCAR either through the web interface or via machine-to-machine interfaces.
	10. During the fifth session of TT-WMD (Task Team on WIGOS Metadata Standards) in December, 2016, it was agreed that the guidance on the WMDS needs to be further developed in order to better assist Members on how to do things; a list of questions about the use of WMDS for specific observing systems could help experts to further elaborate the guidance material. It was noted by the TT-WMD that for specific observing systems, e.g. for surface-based remote sensing observations, individual experts should be identified to contribute to that effort.
	11. It was noted that the training programme on OSCAR proposed by WIGOS Project Office and OSCAR team will be very helpful for understanding of the guidance material and efficient use of the OSCAR by the Members. The use and support of WRD as an important contributor of OSCAR/Surface can also be subject of such training activities.
3. **DECISIONS/ACTIONS REQUIRED**

**The [Work Group] is invited to make the following recommendations**

1. Recommendation 1 (***who; deadline***);

For the further development of the guidance on the WMDS, weather radar expert(s) should be identified to review and to give contribution for this process.

1. Recommendation 2 (***who; deadline***);

The Members not supporting WRD or OSCAR/Surface should be encouraged to be part of these systems by nominating focal points and providing information. The capacity building activities to demonstrate the benefits of those systems for the Members should be arranged.

**2. ISSUES TO BE DISCUSSED**

2.1. How to improve and maintain the WRD (resource allocation, M-2-M interface with OSCAR/Surface, the compatibility with OPERA, to generate WIGOS Metadata Representation (WMDR) compliant XML files etc.)?

2.2. What kind of features and capabilities should be added to the WRD (to add time based fields, a unique WIGOS station identifier, etc.)?

2.3. The contribution of the WRD and OSCAR/Surface for the international radar data exchange?

2.4. The contribution of the WRD and OSCAR/Surface for the evolution and redesign of the observing networks at national, regional and global level?

3. REFERENCES:

1. Final Report of the 5th Session of TT-WMD (ICG-WIGOS TASK TEAM ON WIGOS METADATA)
2. Final Report of Workshop On Regional & Global Exchange of Weather Radar Data (COMMISSION FOR BASIC SYSTEMS-OPAG ON INTEGRATED OBSERVING SYSTEMS)
3. WMO Radar Database Website: http://wrd.mgm.gov.tr/
4. OSCAR Website: https://www.wmo-sat.info/oscar/

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