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# WMO RADAR DATABASE

(Submitted by Ercan Büyükbaş)

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| **Summary and purpose of document**  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. |

**Action proposed**

1. Encourage the Members to register their radars in WRD by increasing the awareness on the use and benefits of the WRD.
2. Consider the integration of WRD to OSCAR/Surface.

**References:**

1. Final Report of Workshop On Regional & Global Exchange of Weather Radar Data (<https://www.wmo.int/pages/prog/www/CBS->Reports/documents/Final\_Report\_Workshop\_Radar\_Data\_Exchange\_Exeter\_April\_2013.pdf)
2. Final Report of First Session of the Task Team on Weather Radar Data Exchange (<https://www.wmo.int/pages/prog/www/OSY/Reports/TT-WRDE-1-July-2016-Final-Report.pdf>)
3. Final Report of the First Meeting of Inter-Programme Expert Team on Operational Weather Radars (http://www.wmo.int/pages/prog/www/IMOP/reports.html)
4. Final Report of Ad-Hoc Workshop Weather Radar Metadata (<http://www.wmo.int/pages/prog/www/WIGOS-WIS/reports/Radar_MD_Workshop_Final-Report_Locarno_19-21Jun2017.pdf>)
5. WMO Radar Database Website ([www.wrd.mgm.gov.tr](http://www.wrd.mgm.gov.tr))

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**4.1.1 OVERVIEW**

4.1.1.1 The development process of the WMO Radar Database (WRD) was started in 2009 as joint task of Commission for the Instruments and Methods of Observation (CIMO) and Commission for Basic Systems (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.

4.1.1.2 A lot of metadata information of the operational weather radars such as owner, manufacturer, and location, operational and technical features are available in WRD for the use of the Members.

4.1.1.3 The radar related documents, pictures of radar sites and movies are available in WRD in case provided by the Members.

4.1.1.4 It is also possible to access the web site of radar images from WRD if it is allowed by the owner/operator of the radars.

4.1.1.5 National Focal Points of the Members have the responsibility and authorization to register the radars, insert and update the metadata in WRD. On the other hand, the update of the radar database can be done by NFPs directly by connecting to the WRD or by sending e-mail to the administrators of WRD.

**4.1.2 STATISTICAL ANALYSIS OF WRD**

4.1.2.1 Since its development and put into operation, 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 November 2017 has reached to a number of 90 (Figure 1).

4.1.2.2 The number of focal points nominated by the Members was 23 by 2011, but WRD has 77 focal points, as of November 2017, to carry out the required tasks for the efficient use and operation of the radar metadata database (Figure 1).

*Figure 1. Number of Members Providing Information for WRD*

4.1.2.3 While the total number of weather radars registered in WRD in 2009 was 464, the metadata of the 969 weather radars are available in WRD as of November 2017 (Figure 2).

*Figure 2. Number of Weather Radars Registered in WRD by the Members*

4.1.2.4 The statistical analysis of the WRD shows that the majority of the Members registered the radars in WRD is from RA-VI with 40 Members while second is RA-II with 17 Members. On the other hand, almost one-third of the total registered radars are operated in RA-VI with a number of 319 radars, and following one in the numbers of the radars is RA-IV with 291 radars (Figure 3).

*Figure 3. Regional Distribution of Radars and Members in WRD*

4.1.2.5 According to the metadata records in WRD, C-Band is the most popular frequency used for weather radars as number of 551. S-Band is the second with 356 radars, X-Band is the third one with 38 radars and SX band is the fourth one with 24 radars when ranking the use of the frequencies (Figure 4).

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

* + 1. **STATUS AND FUTURE IMPROVEMENT OF WRD**

4.1.3.1 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.

4.1.3.2 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.

4.1.3.3 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.

4.1.3.4 WMO established a mechanism for routine update and maintenance of the WRD, with an email reminder and request sent to focal points (FPs) every 3 months, although, FPs were encouraged to maintain the database on ad hoc basis also so as to make changes as soon as they were identified.

4.1.3.5 By considering the requirements it has been planned to develop guidance and procedures on the WRD and its maintenance for the developing Guide to WIGOS.

4.1.3.6 The new features and capabilities of WRD was discussed during the CIMO-IPET-OWR meeting held in Tokyo, in March 2017. It was agreed in the meeting that, under priorities for the WIGOS Pre-operational Phase, the IPET would make a large contribution, regarding the WIGOS Regulatory Material complemented with necessary guidance material to assist Members with the implementation of the WIGOS technical regulations, having a strong focus on development of OWR guidance within its work plan, in particular in relation to WIGOS guidance on the use and application of the OSCAR/Surface system in partnership with the WMO Radar Database (WRD), the specification of the radar metadata model as an application of the WIGOS Metadata Standard (WMD) and requirements for provision of radar-related metadata.

4.1.3.7 A workshop on weather radar metadata with the participation of related experts held in Locarno, in June 2017 to discuss the radar metadata issues, how to ensure the compatibility of WRD metadata model with WIGOS Metadata Standard (WMDS) and OPERA metadata model , and integration of WRD to OSCAR/Surface.

4.1.3.8 In accordance with the decision and request from weather radar metadata workshop, the studies on the following issues are under progress by the experts of Turkish State Meteorological Service:

a) A new field of "WSI" (WMO\_WIGOS\_Station\_Identifier) will be added to WRD in the format of 0.20010.0.[WRD\_Id]. Each radar has a unique WSI without subject to any change or use by another station.

b) Administrator of WRD will insert the WSI for existing radars in WRD. The focal points authorized for the insertion of new radar or update the existing radars will be informed and requested to insert new WSI for their radars in case registering new radar or update the existing ones.

c) It will be ensured that WSI will be compatible with WIGOS guidance material.

d) As it was requested in the workshop, addition of new fields for radar station type (land fixed, land mobile, etc.) have almost been completed.

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