

WORLD METEOROLOGICAL ORGANIZATION

CBS/OPAG-IOS/WxR_EXCHANGE/3.2

COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP
ON INTEGRATED OBSERVING SYSTEMS

28.02.2013

WORKSHOP ON RADAR DATA EXCHANGE

ITEM: 3.2

EXETER, UK, 24-26 APRIL 2013

Original: ENGLISH

CURRENT STATUS OF WEATHER RADAR DATA EXCHANGE

Report on the status of Weather Radar Meta Data held in the WMO Radar Database and recommendations for its further use.

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SUMMARY AND PURPOSE OF DOCUMENT

The document presents report on the status of Weather Radar Meta Data held in the WMO Radar Database and recommendations for its further use.

ACTION PROPOSED

The meeting is invited to review Web-Based WMO Radar Database (WRD) and to discuss actions required to improve and further usage of it.

REPORT ON THE STATUS OF WEATHER RADAR METADATA HELD IN THE WMO RADAR DATABASE AND RECOMMENDATIONS FOR ITS FURTHER USE.

1. Introduction

Radar networks have been created in many countries by National Meteorological and Hydrological Services (NMHS) and different organizations like universities, TV stations, militaries, aviation administrations, power administrations and manufacturers.

New radars are being *added* and *upgrades* are going on in the existing networks. At the same time new radar networks are being established continuously. Some networks have been established by the countries newly faced to the radar technology and also new types of weather radars have been installed by experienced countries.

In this context, a global survey on weather radars has been conducted by WMO to establish a *“fully comprehensive web-based metadata database” of the global use of weather radars.*

Main reasons for establishing this database are :

- Presenting a comprehensive web-based database for radar network planning information and resource allocation for all members,
- Assisting a wide spread international exchange of radar data,
- Gathering radar information to protect radio-frequency spectrum allocation,
- Presenting common issues/problems and potential solutions gathered by questionnaire.

It is composed of a questionnaire (word document) and a spread sheet (excel document) (<http://www.wmo.int/pages/prog/www/Questionnaires.html>) and it has four main sections on the following themes:

- Radar site(s) information,
- Radar hardware characteristics,
- Owner information,
- Data, products and applications.

2. Overview of Database

At the beginning of the project **47 NMHS** replied questionnaire. **516 Radars** had been registered to DB in 2009. Following decisions had been taken:

- Spreading the excel sheet to the operators of Weather Radars **except of NHMSs**
- **Gathering new replies from the NMHSs** had not responded yet (especially having big networks)
- **Establishing a web page** which supports adding and updating radar via focal points in a secure way.

In the Joint meeting of CBS Expert Team on Surface-Based Remotely-Sensed Observations (Second Session) and CIMO Expert Team on Operational Remote Sensing (First Session) between 5 and 9 December 2011 :

- Experts evaluated first version of **Web-based WMO Radar Database (WRD)** developed by Turkish Meteorological Service (TMS).
- Principles of the Operation and Maintenance of the WRD which also includes upgrade, update and export of WRD, had been defined and started its service.
- A **Report for Weather Radar Survey** had been submitted to WMO

(<http://www.wmo.int/pages/prog/www/WRO/docs/radar%20survey%20report%2020110708.pdf>)

To gather data from all NMHSs that operate Weather Radars, WMO sent letters to all PRs in 2011 and 2013 to request an appropriate expert that will act as a *Focal Point (FP)* for *Weather Radar Metadata*, whom WMO can contact directly regarding the provision of weather radar metadata. The **Focal Point** has been thought as responsible for initial metadata entry and routine maintenance of the database under instruction from WMO and the database administrator. Details of assigned Focal Points can be found at WMO Weather Radar Observations page (http://www.wmo.int/pages/prog/www/WRO/index_en.html).

“**Responsibilities of FP for Maintenance of Weather Radar Metadata**” have been defined in WMO Weather Radar Observations Page and “**WMO Radar Database Procedures For Updating Weather Radar Metadata**” can be accessible for focal points after log in to the WRD web page.

2.1 Current status of WRD

1	NMHS	# of radars added to DB in years			
		2009	2010/2011	2012	2013
2					
3	Armenia				3
4	Australia				58
5	Austria	5			
6	Azerbaijan	2			
7	Bangladesh	5			
8	Belarus	3			
9	Belgium	2			1
10	Belize	1			
11	Brazil	2			33
12	Brunei			1	
13	Bulgaria	3			
14	Canada	31			
15	Croatia	2			
16	Cyprus	1			
17	Czech Rep.				2
18	Denmark				4
19	Estonia	2			
20	Finland	8			
21	France	24			
22	Germany	16			
23	Greece				4
24	Hong Kong	3			
25	Hungary	3			
26	Iceland		1		
27	Indonesia	19			
28	Iran	5			
29	Israel	1			
30	Italy	22			
31	Japan	29			
32	Jordan	1			
33	Korea Rep.				10
34	Latvia	1			
35	Macau		1		
36	Makedonia				2
37	Malaysia				12
38	Mali				3
39	Moldova				8
40	Morocco			1	
41	Myanmar	1			
42	Netherlands	2			
43	New Zealand	6			
44	Norway	8			
45	Pakistan	7			
46	Panama	1			

47	Paraguay			1	
48	Poland	8			
49	Portugal				2
50	Romania				7
51	Russia				16
52	Serbia	14			
53	Singapore	1			
54	Slovakia	2			
55	Slovenia	1			
56	South Africa	24			
57	Spain	15			
58	Sweden	12			
59	Switzerland				3
60	Tajikistan				4
61	Thailand	26			
62	Trinidad& Tobago	1			
63	Tunisia	1			
64	Turkey	4	4	2	
65	Ukraine	7			2
66	United Arab Emirates	6			2
67	United Kingdom	16			
68	USA	121			
69	Uzbekistan	1		2	

*Red colour indicates added radars online.

Owner	Added Number of Radars			
	2009	2010_2011	2012	2013
Vaisala in Finland		2		
TV Stations in USA (Baron)			64	
US Air Force	26			
US FAA	12			
University (UAH-MAX)			1	

Weather radars of owner other than NMHSs

Currently **652 radars of 67 NMHS** and **105 radars of other owners** and **totally 757 weather radars** have been included in WRD.

3. Current WRD Web Page and its further usage

Basic features:

- URL address of the web page is <http://wrd.mgm.gov.tr>
- Features like basic search, search based on countries, parameters of individual radars, materials, statistics with graphs are active currently. Basic search can be done by following parameters: Country, Band, TX Type, and Polarization.
- The web page can run with all platforms with current infrastructure. Executability of the web page with all platforms is the first purpose.
- WMO Information Systems (WIS) will be able to download up to date DB regularly from web page.
- Statistics are updated automatically from database.
- Images of the radars can be seen by the links of radar images, if they are added by focal points.
- English and Turkish Languages are active currently. Language is selected automatically according to used operating system. Other languages will be able to add later by help of focal point or WMO.
- FPs can access their own network by user name and password. They can update their present network and add new radars to the network by e-mail and online options. They can change passwords.
- Updates and adding new radars by FPs have been started successfully.

New features, further usage and to do:

- Country networks can be seen on **Virtual Earth** (added in February 2013 and Google map will be added too)
- Weather Radar Survey performed in 2009 was very comprehensive. Some parts of the survey can be focused and **new online surveys** can be done by help of focal points via WRD web page and related parts of the survey report can be updated. A test survey is going to be created in 2013 for FPs.
- **New statistics** can be added.
- **More materials** can be added.
- **Forums** about different subjects can be added
- Updating data of Europe should be started from **OPERA** to the database.
- **More FPs** should be assigned by PRs
- Although number of radar in DB has been increasing rapidly, there is **a gap to be filled**