

WORLD METEOROLOGICAL ORGANIZATION

CBS/ET-SBRSO-2 & CIMO/ET-ORS-1/Doc.3.1.1

**JOINT MEETING OF
CBS EXPERT TEAM ON SURFACE-BASED REMOTELY-
SENSED OBSERVATIONS
(Second Session)**

(15.XI.2011)

**AND
CIMO EXPERT TEAM ON OPERATIONAL REMOTE
SENSING
(First Session)**

ITEM: 3.1

Original: ENGLISH ONLY

(GENEVA, SWITZERLAND, 5-9 DECEMBER 2011)

**WEATHER RADAR OPERATIONS, STATUS, ISSUES, REQUIREMENTS FOR DATA
EXCHANGE AND PLANS**

International and regional network status

Report on RADAR survey results and establishment of the metadata database

(Submitted by Oguzhan Sireci, Turkish State Meteorological Service)

SUMMARY AND PURPOSE OF DOCUMENT

Presents weather radar survey results and web-based weather radar metadata database.

ACTION PROPOSED

1. The Joint Meeting is invited to review the web page of weather radars database and to discuss actions required to improve the database.
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Introduction

Doppler Weather Radar is an indispensable precipitation observing system for very large scale areas. They are essential meteorological tools in severe weather warnings, precipitation estimation and its spatial distribution, air traffic management, disaster management, numerical weather prediction (verification and data assimilation), agriculture, hydrological, weather modification and climate applications. Radar networks have been created in many countries by NHMS's and different internal agencies.

A global survey on weather radars has been conducted since 2009, in scope of CIMO Expert Team on Remote-Sensing Upper-Air Technology and Techniques work plan to establish a fully comprehensive database of the global use of weather radars. Main reasons for establishing this database: 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) and it has four main sections on the following themes: Radar site(s) information, Radar hardware characteristics, Owner information and Data, products and applications.

Overview of Questionnaire and Replies

Totally 67 countries have been replied the questionnaire so far. 11 countries including Bosnia Herzegovina, Chile, Egypt, Kazakhstan, Kyrgyzstan, Mauritius, Monaco, Seychelles, Sudan, Uruguay, and Zambia informed that they are not operating weather radar. 7 countries including Algeria, Argentina, Botswana, China, Korea, Malaysia and Russia replied questionnaire due to they are operating weather radars, but their filled spread sheet haven't reached. There is no information regarding with the number and type of the radars operated by this countries for this reason. Totally 526 weather radar information have been sent by remaining 49 countries. (<http://www.wmo.int/pages/prog/www/Questionnaires.html>). A report has been prepared for questionnaire and excels spread sheets in 2011.

Country	Radar #	Country	Radar #	Country	Radar #
Austria	5	Hungary	3	Singapore	1
Azerbaijan	2	Indonesia	19	Slovakia	2
Bangladesh	5	Iran	5	Slovenia	1
Belarus	3	Israel	1	South Africa	24
Belgium	2	Italy	22	Spain	15
Belize	1	Japan	29	Sweden	12
Brazil	2	Jordan	1	Thailand	26
Bulgaria	3	Latvia	1	Trinidad& Tobago	1
Canada	31	Myanmar	1	Tunisia	1
Croatia	2	Netherlands	2	Turkey	10
Cyprus	1	New Zealand	6	Ukraine	7
Estonia	2	Norway	8	United Arab Emirates	6
Finland	8	Pakistan	7	United Kingdom	16
France	24	Panama	1	USA	159
Germany	16	Poland	8	Uzbekistan	1
Hong Kong	3	Serbia	14		

New Replies in 2010/2011

Iceland	1	Macau	1	Finland /Vaisala	2
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Many countries except of these 65 countries have not replied the questionnaire yet. These countries include Australia, Denmark, India, Greece, Portugal, Saudi Arabia and so on. It is expected that after completing missing information, this number will be doubled. Especially, impact of the data which will be gathered from China, Australia, Russia, India, Korea and airports of USA can be expected to affect the numbers fairly. A **Report for Weather Radar Survey** has been prepared and submitted to WMO (Annex-1). In the report, all questions in the Questionnaire and Excel Sheets have been analyzed.

World Weather Radar Web Page

Web page studies of the weather radar database have been carried out by Turkish Meteorological Service in scope of CIMO Expert Team on Operational Remote Sensing (ET-ORS) work plan. All replies gathered together on excel sheets to use in web page. First version of the web page completed in 2011. URL address of the web page is <http://wwr.dmi.gov.tr> and hosted by Turkish Meteorological Service. Features like basic search, search based on countries, parameters of individual radars, materials, statistics with graphs are active currently. Statistics are updated automatically from database. Images of the radars can be seen by the links of radar images. A Google link for each radar also placed individual radar pages.

WMO has been sent a letter to PRs to assign a responsible contact person for each NHMS and has communicated with OPERA (EUMETNET, Operational Program for the Exchange of weather Radar information) to keep updated the database. Accounts will be developed for each radar owner and responsible persons will be able to update their own networks. Updated data of Europe will be supplied by OPERA to the database.

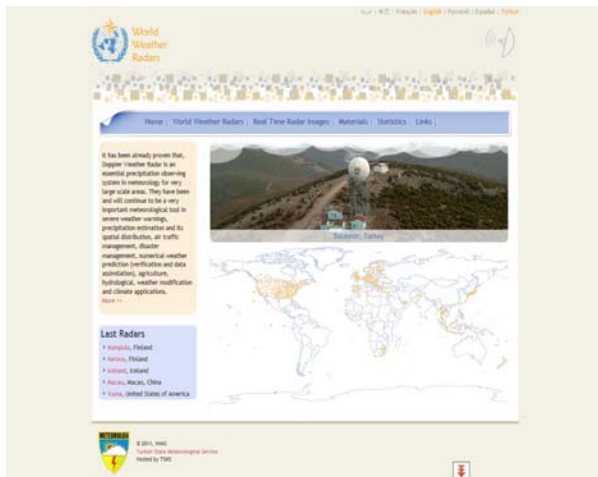


Figure 1: Main page



Figure 2: Search with basic parameters



Figure 3: Search based on countries

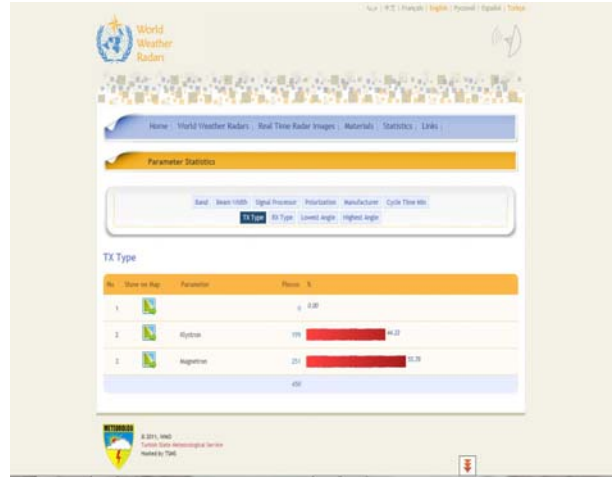


Figure 4: Dynamic statistics from database

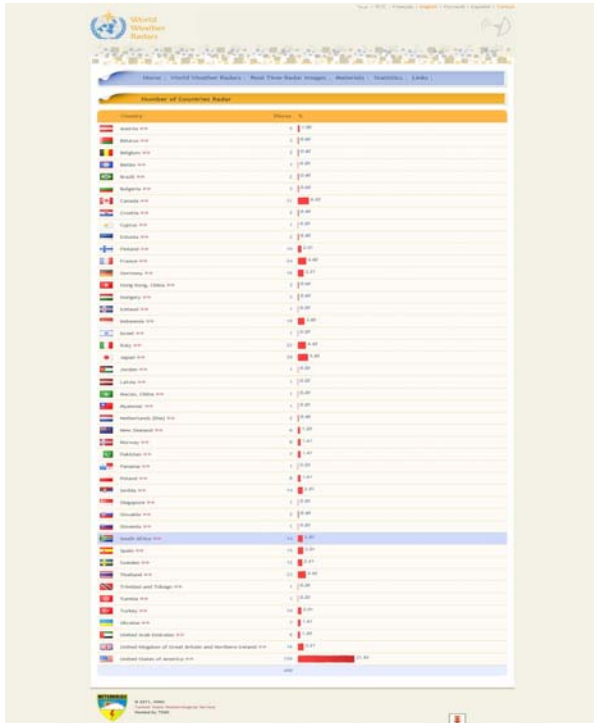


Figure 5: Dynamic statistics from database

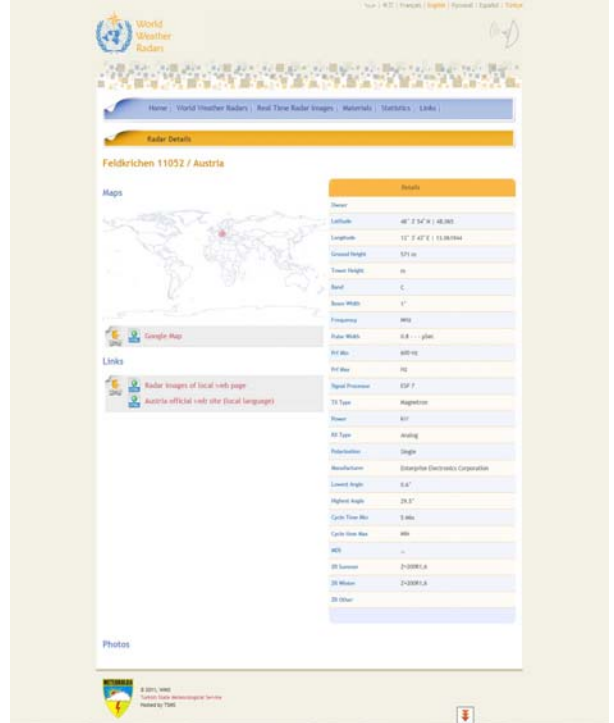


Figure 6: Individual radar page

Next Steps

- Although replies to the questionnaire which is prepared for establishing a comprehensive web-based weather radar database are very encouraging, there is a gap to be filled.
- To gather data from all countries that operate Weather Radars, WMO sent a letter to all PRs on 16th August 2011 to request an appropriate expert that will act as a *Focal Point 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.
- Organizations that operate weather radars except of NHMSs (like universities, airports, TV stations, manufacturers, militaries) have been added to database in the meantime. Weather radars operated by FAA, U.S. Air Force and Vaisala Company have been added to database in this scope. New methods should be search to gather data from these kinds of operators also.
- Sharing principles of the database in case of requests with members and other persons/organizations should be defined
- User authorization levels should be determined
- Remarks and opinions of experts should be discussed on structure of the webpage for improvement
- First update will be realized from OPERA

INF.3.1.1 - Report on Weather Radar Survey
