

**WORLD METEOROLOGICAL ORGANIZATION**

CBS/OPAG-IOS (ET-AWS-6)/Doc. 2

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

(15.4.2010)

**EXPERT TEAM ON REQUIREMENTS AND  
IMPLEMENTATION AWS PLATFORMS (ET-AWS)**  
*Sixth Session*

ITEM: 2

Original: ENGLISH

GENEVA, SWITZERLAND, 20 – 23 APRIL 2010

## **REPORT OF THE CHAIRPERSON**

*Submitted by Karl Monnik, ET-AWS Chair (Australia)*

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### **Summary and Purpose of Document**

The document provides a summary on the activities of the Expert Team on requirements and implementation AWS platforms

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### **ACTION PROPOSED**

The meeting is invited to note the information contained in this document when considering its recommendations.

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#### **Appendix:**

[1] WMO CBS ET-AWS: Terms of Reference and Work Plan

#### **References:**

[1] WMO CBS-XIV WMO-No. 1040.

## REPORT OF THE CHAIRPERSON

1. The Work Plan and Terms of Reference of the WMO CBS Expert Team on Requirements and Implementation AWS Platforms (ET-AWS) approved by CBS-XIV is attached at the end of the report.
2. The previous meeting of ET-AWS was held in Geneva, Switzerland, 5-9 May 2008. Since this meeting several changes have been made to the members of the team and the work plan was updated.
3. At CBS-XIV Karl Monnik (Australia) and Rabia Merrouchi (Morocco) were selected as chair and co-chair of ET-AWS respectively. The former chair, Dr Igor Zahumensky stepped down subsequent to ET-AWS-5 due to other responsibilities in WMO. I would like to thank Dr Zahumensky for his excellent work as chair during the previous period.
4. Subsequently new members of the ET-AWS were selected. These members were confirmed in August 2009:
 

1. MONNIK, Karl	Chair	Australia	RAV
2. MERROUCHI, Rabia	Vice-chair	Morocco	RAI
3. NITU, Rodica		Canada	RAIV
4. LEROY, Michel		France	RAVI
5. *VASHISTHA, R.D.		India	RAII
6. TUTEN, Ozden		Turkey	RAVI

\*Replaced by Mr Sevakula KRISHNAIAH (India)
5. In the summary report on CBS-XIV, the following statements were made. This has provide a focus for the activities of ET-AWS.

### ***Requirements and representation of data from AWSs***

**6.1.26** The Commission reviewed the revised Functional Specifications for Automatic Weather Stations based on input from other technical commissions and adopted [Recommendation 2 \(CBSXIV\)](#)

– [Revised functional specifications for automatic weather stations.](#)

**6.1.27** It requested the OPAG-ISS to develop BUFR descriptors for all the variables listed in the “Functional Specifications for Automatic Weather Stations” and to develop metadata compliant with the WMO metadata profile.

**6.1.28** It reviewed the “Basis Set of variables to be Reported by a Standard AWS for Multiple Users” and adopted [Recommendation 3 \(CBS-XIV\) – Basic set of variables for a standard automatic weather station for multiple users.](#)

**6.1.29** It requested the OPAG-IOS to continue development of the four AWS metadata catalogues, namely: (a) variables measured; (b) instruments used; (c) data processing procedures used; and (d) data QC procedures.

**6.1.30** It noted that there is no dedicated expert team within the Commission dealing with the operational issues related to the surface observing networks, agreed to rename the ET on Requirements and Representation of Data from AWS (ET-AWS) to the ET on Requirements and Implementation of AWS Platforms (ET-AWS) and agreed on new Terms of Reference for the ET-AWS.

6. The WMO Integrated Global Observing System (WIGOS) is a significant focus for the WMO. It aims to develop a comprehensive, coordinated and sustainable system of observing systems. While AWS is only a small component of a much larger system, with the expansion of automated networks across many member countries, ET-AWS has an important role to play to ensure guidance materials developed contribute to the WIGOS goal. In this regard I am pleased that this meeting will come to grips with WIGOS in order to shape our future work plans.

7. Over the past year there have been numerous discussions with a range of experts based on CBS-XIC Recommendations 6.1 and 6.2 (attached at the end of the document) and other ET-AWS tasks. I would like to highlight a few of these.
  - 7.1. There have been several exchanges with a range of experts to refine the Annex to Recommendation 6.1.2 (CBS-XIV) Functional Specification for Automatic Weather Stations. These issues relate to maximum effective range and reporting resolution. Particular parameters relate to hydrology, the marine environment and slant path visual range. With the presence of experts this week I believe we are likely to resolve this.
  - 7.2. Considerable effort has been exerted by Dr Eva Cervena in the development of suitable BUFR descriptors for each of the variables mentioned in the table of Functional specifications for Automatic Weather Stations. A large number of the Elements (or Variables) have been addressed including radiation, temperature, wind, humidity, cloud, hydrology and marine data. This review has required the input of a wide range of experts from several expert teams. Many of the variables have operational descriptors in BUFR; though there are still a number which require validation. A small number still requires further refining of the functional specification.
  - 7.3. An *ad hoc* Working Group meeting on the WIGOS project was held in Geneva during October 2009. I was not able to personally attend, but Michel Leroy, as member of ET-AWS was able to attend. Good progress was made at refining the classification and I look forward to discussing it further during this session.
  - 7.4. In terms of an initiative by ET-AWS-5 to examine the potential AWS Networks support the calibration of space-based observations and product validation, ET-SUP and ET-SAT welcomed this opportunity and saw it as a timely initiative in the context of WIGOS. At this stage the initiative requires more extensive consideration and consultation.
  
8. It is proposed that the focus for the next intersessional period will be:
  - Address requirements for integration, interoperability, standardization and homogeneity of the WIGOS concept through enhancing existing WMO documentation;
  - Monitor and update AWS Functional Specifications (FS) for all WMO-related Programmes including updating basic set of variables to be reported by a standard AWS for multiple users
  - Review of BUFR descriptors and BUFR templates for variables measured by AWS;
  - Further development of AWS metadata catalogues;
  - In consultation with ET-SUP and ET-SAT, investigate the potential for AWS to contribute to the calibration and ground truth of space-based observations;
  - Develop the requirements and standards for a basic, robust AWS suitable for less developed and remote areas in consultation with manufacturers and WMO member countries;
  - Develop requirements for new data types from AWS sensors in consultation with ET-DRC ;
  - Monitor advances in AWS technology and develop standards for integration into AWS networks.

## 9. Extract from CBS-XIV

### **Requirements and representation of data from AWSs**

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**6.1.29** It requested the OPAG-IOIS to continue development of the four AWS metadata catalogues, namely: (a) variables measured; (b) instruments used; (c) data processing procedures used; and (d) data QC procedures.

**6.1.30** It noted that there is no dedicated expert team within the Commission dealing with the operational issues related to the surface observing networks, agreed to rename the ET on Requirements and Representation of Data from AWS (ET-AWS) to the ET on Requirements and Implementation of AWS Platforms (ET-AWS) and agreed on new Terms of Reference for the ET-AWS.

### **Terms of Reference**

#### **Expert Team on Requirements and Implementation of AWS Platforms (ET-AWS)**

- (a) Address the evolution of the AWS observing network;
- (b) Address requirements for integration, interoperability, standardization and homogeneity of the WIGOS concept;
- (c) Monitor advances in AWS technology;
- (d) Develop draft recommendation for updating of the *Manual* and the *Guide on the GOS* in the context of WIGOS concept;
- (e) Provide advice to ET-EGOS and OPAG-IOIS on surface in situ contributions to the GOS to address the identified requirements and overcome known deficiencies and gaps;
- (f) Provide advice and support to the Chairperson of OPAG-IOIS on development and implementation of WIGOS concept.

### **Recommendation 2 (CBS-XIV)**

#### **REVISED FUNCTIONAL SPECIFICATIONS FOR AUTOMATIC WEATHER STATIONS**

THE COMMISSION FOR BASIC SYSTEMS,

#### **Noting:**

(1) The request of CBS-Ext.(06) to revise automatic weather station (AWS) functional specifications,

(2) The Expert Team on Requirements for Data from Automatic Weather Stations (ET-AWS) Work Plan 2007–2008 to revise AWS functional specifications,

**Considering** that the AWS functional specifications have been reviewed and updated based on

the inputs and proposals of other technical commissions,

**Recommends** that the revised Functional Specifications for Automatic Weather Stations (see

annex) be approved;

**Requests** that the Secretary-General make arrangements for the publication of the updated *Guide*

*to the Global Observing System* (WMO-No. 488).

**Recommendation 3 (CBS-XIV)**  
**BASIC SET OF VARIABLES FOR A STANDARD AUTOMATIC WEATHER STATION FOR MULTIPLE USERS**

THE COMMISSION FOR BASIC SYSTEMS,

**Noting:**

- (1) The request of CBS-Ext.(06) to revise the basic set of variables to be reported by a standard automatic weather station (AWS),
- (2) The Expert Team on Requirements for Data from Automatic Weather Stations (ET-AWS) Work Plan 2007–2008 to revise the list of the basic set of variables to be reported by a standard AWS for multiple users,

**Considering that:**

- (1) The *Manual on the Global Observing System* (WMO-No. 544) prescribes the variables to be measured by the various types of weather observing stations,
- (2) Differences exist between the set of variables measured by synoptic, ocean weather, aeronautical, hydrological, agrometeorological and climatological stations, which result in ambiguities when exchanged between disciplines,
- (3) There is a need for the standardization of observations,
- (4) A standard set of variables shall be measured for all these disciplines, whereas other variables should be measured as recommended by technical commissions or regional associations,
- (5) The basic set of variables to be reported by a standard AWS has been reviewed and updated based on the proposals received from other technical commissions,

**Recommends** that the revised basic set of variables to be reported by a standard AWS (see annex) be approved for inclusion in the *Manual on the Global Observing System* (WMO-No. 544);

**Requests** that the Secretary-General make arrangements for the publication of the updated *Manual on the Global Observing System*.

**ET-AWS WORK PLAN FOR 2009-2012**  
(Expected Result 4)

Task	Deliverable/Activity	Id	Source Cttee	Source id	Due	Responsible	Status	Comment
To contribute to the development and implementation of concept of WIGOS and provide relevant advice and support to the chairperson of ICT-IOS	Address relevant items of WIGOS Implementation Activities agreed by EC-WG/WIGOS-WIS-2	IOS-1	CBS-XIV	12.2.3		MONNIK, Karl		
Develop and maintain the requirements and specifications for automated observations networks in collaboration with ET-EGOS and application areas	Monitor and update AWS Functional Specifications (FS) for all WMO-related Programmes  Update the list of basic set of variables to be reported by a standard AWS for multiple users	IOS-2	CBS-XIV	12.2.3		MERROUCHI, Rabia		
Develop the requirements and standards for a basic, robust AWS suitable for less developed and remote areas	Review progress made in ET-AWS-5  Review requirements with Regional networks  Develop standards in liaison with HMEI	IOS-3	CBS-XIV	12.2.3		VASHISTHA, R.D.		
Develop requirements for AWS to contribute directly to the calibration and ground truth of space-based observations	Review and expand existing requirements	IOS-4	CBS-XIV	12.2.3		MONNIK, Karl		

Task	Deliverable/Activity	Id	Source Ctee	Source id	Due	Responsible	Status	Comment
Develop the requirements for new sensors or the integration of sensors to address the deficiencies of AWS following the migration from manual observations	Update guidelines and procedures to assist in the transition from manual to automatic surface observing stations  Review requirements for manual observations with subject area specialists including JCOMM, CAgM, CHy, CCI and GCOS	IOS-5	CBS-XIV	12.2.3		TUTEN, Ozden		
Develop requirements for new data types from AWS sensors	Finalize the draft version of ET-AWS-5	IOS-8	CBS-XIV	12.2.3		TUTEN, Ozden		
Develop AWS metadata catalogues for WIS	Prepare tables of AWS metadata for WIS based on BUFR descriptors	IOS-9	CBS-XIV	12.2.3		NITU, Rodica		
Develop guidelines for the siting classification of surface observing stations	In coordination with CIMO and other relevant TCs, finalize the guideline materials for Members	IOS-10	CBS-XIV	12.2.3		LEROY, Michel		
Review BUFR descriptors related to AWS measurements according to requirements	Review BUFR descriptors and propose new ones if needed. Implement and validate BUFR template for SYNOP/AWS reporting (including new station identification) and validate BUFR templates for AWS data from n-minute period and for representation of nominal values.	IOS-12	CBS-XIV	12.2.3		LEROY, Michel		

Task	Deliverable/Activity	Id	Source Ctee	Source id	Due	Responsible	Status	Comment
Monitor advances in AWS technology and develop standards for integration into AWS networks	Review progress and advances in AWS technologies  Review existing standards and guides to identify gaps	IOS-13	CBS-XIV	12.2.3		NITU, Rodica		