



**WORLD METEOROLOGICAL ORGANIZATION  
REGIONAL ASSOCIATION II (ASIA)**

**JMA/WMO TRAINING WORKSHOP ON  
CALIBRATION AND MAINTENANCE OF  
METEOROLOGICAL INSTRUMENTS IN RA II (ASIA)**

**Japan, 19-22 February 2013**

**FINAL REPORT**

**JAPAN METEOROLOGICAL AGENCY  
WORLD METEOROLOGICAL ORGANIZATION**



*Participants in the JMA/WMO Training Workshop on Calibration and Maintenance of Meteorological Instruments in RA II (Asia), Japan, 19-22 February 2013*

## GENERAL SUMMARY

### 1. Introduction

1.1 At its fourteenth session held in Tashkent, Uzbekistan in December 2008, Regional Association II (Asia) established the Pilot Project to Enhance Availability and Quality Management Support for National Meteorological and Hydrological Services (NMHSs) in Surface, Climate and Upper-air Observations. The project was intended to provide technical support to NMHSs in developing and least developed countries in order to promote the availability of quality-assured observation data from weather, climate and upper-air stations. The Japan Meteorological Agency (JMA) was appointed as the Coordinator of the Pilot Project.

1.2 Within the framework of the project, the JMA/WMO Workshop on Quality Management in Surface, Climate and Upper-air Observations was held in Tokyo, Japan in July, 2010. Two questionnaire surveys (one on surface, climate and upper-air observations and quality management and the other on meteorological instruments, calibration and training) were also conducted in 2010 and 2011, respectively.

1.3 The outcomes of the workshop and the results of the questionnaire surveys indicated that instrument calibration/maintenance issues are a primary factor adversely affecting data quality, and that the main cause of these problems is a lack of measurement traceability to international standards and calibration facilities. This finding highlights the critical importance of roles of Regional Instrument Centres (RICs) in the improvement of observation data quality among RA II Members.

1.4 RA II, at its fifteenth session held in Doha, Qatar in December 2012 adopted the Regional WMO Integrated Global Observation System (WIGOS) Implementation Plan for RA II (R-WIP-II). Within R-WIP-II, a Project to Enhance Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations was established in accordance with the outcomes of the Pilot Project. This effort involves improvement of data quality at RBCN/RBSN stations and enhancement of RIC capabilities.

1.5 As a follow-up activity by RIC-Tsukuba operated by JMA and as part of its contribution to the implementation of the WIGOS Project, JMA, in collaboration with WMO, organized a training workshop from 19 to 22 February 2013 in Tokyo and Tsukuba to provide RA II Members with lectures and practical exercises in calibration and maintenance of meteorological instruments with the aim of improving their understanding of measurement traceability and related skills.

1.6 A total of 13 experts from 13 NMHSs in RA II, one expert in meteorological instruments from RIC-Beijing (China), one keynote speaker and 23 experts from JMA participated in the workshop. The list of participants and the programme of the workshop are given in **Appendix 1** and **Appendix 2**, respectively.

1.7 The documents delivered at the workshop have been posted at the website of RIC-Tsukuba at [http://www.jma.go.jp/jma/en/Activities/RIC\\_Workshop\\_2013/documents/documents.html](http://www.jma.go.jp/jma/en/Activities/RIC_Workshop_2013/documents/documents.html).

### 2. Opening

2.1 The training workshop was officially opened by Dr Masashi Nagata, Director-General of the Observations Department of JMA at 10:00 a.m. on 19 February 2013 at the JMA headquarters in Tokyo, Japan. He welcomed all participants, expressing deep privilege and honor at having the opportunity to host the workshop in cooperation with WMO. Dr Nagata highlighted the need for capacity development in the maintenance and calibration of meteorological instruments, and stressed the critical importance of RICs' roles in the improvement of observation data quality among RA II Members. He concluded by wishing the participants a productive training session and a comfortable and pleasant stay in Japan.

### **3. Keynote lecture**

3.1 The keynote lecture was given by Mr Kunio Akatsu (Japan International Cooperation Agency), who shared information on practical experiences and gave valuable advice based on his career in international cooperation activities for weather services in developing countries. He introduced actual examples highlighting issues such as unrealistic results of analysis from observation data obtained using poorly maintained instruments, and also provided information on the current status of instrument maintenance and calibration by RA II and RA V (South-West Pacific) Members. He stressed the need for capacity development in fundamental skills for instrumental maintenance and calibration, highlighting points to note when Automatic Weather Stations (AWSs) are put into operational service.

### **4. Report from the RA II WIGOS Project Coordinator (Quality Management)**

4.1 Mr Yoshihisa Kimata, Coordinator of the RA II WIGOS Project to Enhance Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations, reviewed key activities and outcomes of the Pilot Project for the period from 2009 to 2012, including outcomes of the 2010 workshop and the results of the two questionnaire surveys conducted in 2010 and 2011. He highlighted the importance of RICs' roles in improving data quality in RA II based on these outcomes, and stated his expectation that this workshop would help to improve the capacity of participating members in the field as a contribution to implementation of R-WIP-II.

### **5. Report from RIC-Beijing**

5.1 The services and activities of RIC-Beijing were reported by Mr Zeqiang Bian (China), who spoke about the roles and functions of the Meteorological Metrology Station (RIC-Beijing), the status of instruments and traceability, the updated status of the world meteorological instrument catalogue, contributions to international instrument comparison and future plans.

### **6. Country reports**

6.1 All experts of participating Members gave comprehensive and detailed presentations on meteorological instruments in their own Services. The presentations included information on the current status of surface observation instruments and related maintenance and calibration, major technical issues to be tackled and future plans, and included sample pictures. The introduction of case examples detailing issues experienced at observation stations, problems with meteorological instruments and related recovery work helped participants to understand the different situations faced by other Members.

### **7. Lectures and practical exercises**

7.1 From 20 to 22 February 2013 at the premises of RIC-Tsukuba, the experts of RIC-Tsukuba delivered lectures on specific items which were followed by practical exercises.

7.2 A lecture on the traceability and maintenance of meteorological instruments and presentations on the calibration of meteorological instruments for pressure, humidity and temperature was given. As a result, participants learned more about the traceability of measurements, deepened their knowledge of meteorological instruments, and strengthened their grounding in instrument calibration.

7.3 Practical exercises on meteorological instrument calibration for pressure, humidity and temperature were conducted. All participants took part in these sessions and gained hands-on experience in calibration. Through this work, participants were reminded of the need for periodic checking/calibration and the significance of standards and calibration laboratories.

7.4 Mr Naoki Kaneko (Japan Association of Meteorological Instrument Engineering) delivered a presentation on the recent meteorological instrument technologies including laser snow depth meters, ultrasonic meteorological equipment, automatic rain samplers, balloons for meteorological

observation and other products.

## **8. Closure**

8.1 In closing, Mr Yoshihisa Kimata thanked all participants for their cooperation and active participation in the workshop, noting that there had been many interesting discussions and fruitful information exchange through the sessions. The participants expressed their appreciation to JMA for hosting the training workshop in Japan and for the excellent organization and cooperation. The workshop closed at 2:00 p.m. on 22 February 2013.

## **9. Conclusion**

9.1 The sessions of the workshop provided a good opportunity to share practical and essential experiences on meteorological instruments with RA II Members and the RIC staff. All participants diligently and actively participated in the lectures and the practical exercises. In particular, those with no appropriate standards and calibration equipment in their Services enthusiastically took part in the practical exercises to deepen their understanding of meteorological instrument calibration/maintenance and to develop related skills.

9.2 There were significant differences in meteorological instrument calibration/maintenance capacity among the participating Members. Although some had already established calibration capacity based on their own standards and calibration equipment, most still had difficulty in regular maintenance and calibration mainly due to a lack of appropriately calibrated reference instruments traceable to international standards, maintenance support, and/or skills in calibration and instrument maintenance.

9.3 All participants understood the effectiveness of practical exercises in calibration and maintenance of meteorological instruments and emphasized the urgent need for such practical training opportunities, especially for developing countries. Focus should therefore be placed on further provision of practical training opportunities on instrumental maintenance and calibration, including on-site technical support given by experts from RICs according to the situations and needs of Members. As many Members still do not have adequate calibration equipment, it is also important to share information on the need for standards and calibration equipment with funding agencies to promote related financial support.

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## LIST OF PARTICIPANTS

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Mr Naoki Kaneko

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## PROGRAMME OF THE WORKSHOP

**Tuesday, 19 February**

(JMA Headquarters, Tokyo)

- 10:00-10:10 Opening  
 10:10-10:20 Group Photograph  
 10:20-10:30 *Coffee break*  
 10:30-11:30 Keynote lecture  
 11:30-12:00 Report from the RA II WIGOS Project Coordinator (Quality Management)  
 12:00-13:30 *Lunch*  
 13:30-14:00 Report from RIC-Beijing  
 14:00-15:30 Country reports
- Bangladesh
  - Cambodia
  - Lao P.D.R.
  - Maldives
  - Mongolia
  - Myanmar
- 15:30-15:45 *Coffee break*  
 15:45-17:30 Country reports
- Nepal
  - Oman
  - Pakistan
  - Qatar
  - Sri Lanka
  - Thailand
  - Viet Nam
- 17:30-17:45 Report from JMA  
 17:45-18:15 Site tour of the Headquarters of JMA  
 18:30-20:00 *Reception*

**Wednesday, 20 February**

(RIC-Tsukuba, Tsukuba)

- 11:00-12:00 Introduction of RIC-Tsukuba's role and activities  
 12:00-13:30 *Lunch*  
 13:30-15:10 Site tour in RIC-Tsukuba (the Meteorological Instruments Center)  
 15:10-15:30 *Coffee break*  
 15:30-16:30 Lecture on traceability and maintenance of meteorological instruments

**Thursday, 21 February**

(RIC-Tsukuba, Tsukuba)

- 09:00-10:00 Lecture on calibration of meteorological instruments (Pressure)  
 10:00-10:15 *Coffee break*  
 10:15-12:00 Practice on calibration of meteorological instruments (Pressure)  
 12:00-13:30 *Lunch*  
 13:30-14:30 Lecture on calibration of meteorological instruments (Humidity)  
 14:30-14:45 *Coffee break*  
 14:45-16:30 Practice on calibration of meteorological instruments (Humidity)

**Friday, 22 February**

(RIC-Tsukuba, Tsukuba)

- 09:00-10:00 Lecture on calibration of meteorological instruments (Temperature)  
 10:00-10:15 *Coffee break*  
 10:15-12:00 Practice on calibration of meteorological instruments (Temperature)  
 12:00-13:00 *Lunch*  
 13:00-14:00 Introduction of the recent technology in meteorological instruments  
 14:00 Closure
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