

**WORLD METEOROLOGICAL ORGANIZATION**

**COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION**

**EXTRAORDINARY MEETING OF THE PROJECT TEAM  
(8<sup>th</sup> WMO INTERCOMPARISON OF  
HIGH QUALITY RADIOSONDE SYSTEMS)**

**Geneva, Switzerland  
15 – 18 February 2011**



**FINAL REPORT**

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## **EXECUTIVE SUMMARY**

The extraordinary meeting of the project team of the 8<sup>th</sup> WMO Intercomparison of High Quality Radiosonde Systems was organized to agree among the project team members on the data evaluation procedures, and on the presentation of the results in the final report prior to its distribution to the intercomparison participants and to the member of the International Organising Committee for Upper-Air Instrument Intercomparisons for comments/review. The meeting agreed on the evaluation procedures, content, outline and layout of the Draft Final Report and on the responsibilities of individuals in finalising the report.

## GENERAL SUMMARY

### 1. ORGANIZATION OF THE SESSION

#### 1.1 Opening of the Session

1.1.1 The Extraordinary Meeting of the Project Team of the 8<sup>th</sup> WMO Intercomparison of High Quality Radiosonde Systems was held at the WMO Headquarters, in Geneva, Switzerland, 15-18 February 2011. The Chairperson, Mr Tim Oakley, opened the meeting and welcomed the participants to the meeting.

1.1.2 Dr Wenjian Zhang, Director of the WMO Observing and Information Systems Department welcomed the participants. He recalled that the WMO Technical Commission for Instruments and Methods of Observation (CIMO) together with the Commission for Basic Systems (CBS) will have major responsibility in implementing WIGOS. Therefore, the results of the intercomparison should be widely published and included in the CIMO Guide, as relevant. He also mentioned the interest of the Association for Hydro-Meteorological Equipment Industry (HMEI) to closely collaborate with WMO and the importance of the intercomparison results for its members.

#### 1.2 Adoption of the Agenda

The ET/IOC adopted the [Agenda](#) for the meeting, which is reproduced at the beginning of this report.

#### 1.3 Working Arrangements for the Session

The ET/IOC agreed on working hours and tentative timetable for the session.

### 2. PROGRESS REPORTS

#### 2.1 Report of the Chairperson

2.1.1 Mr Tim Oakley, the Chairperson and Project Leader of the 8<sup>th</sup> WMO Intercomparison of High Quality Radiosonde Systems summarized the steps that were taken to analyse the results of the intercomparison and to prepare the draft final report.

2.1.2 He stressed that the meeting would have to pay special attention to the wording that will be used in the final report to ensure that it is neutral and fair, as it could have significant impact on the manufacturers which participated in the intercomparison and on Members, which will use it for tendering processes.

#### 2.2 Report of the Radiosonde Test Expert

2.2.1 The Radiosonde Test Expert, Dr John Nash, summarized his activities in analysing the results and the contacts he had with manufacturers to clarify points of concerns.

2.2.2 He stressed that the conditions in which the intercomparison was carried out, in a tropical moist environment with lots of vertical structures in the atmosphere, were very challenging for the participating instruments and showed their limitations. This was precisely why this location had been chosen for the intercomparison. Carrying out such an intercomparison in a location with dry upper atmosphere would not have allowed to identify the limitations of the systems as well and would have shown even better overall performances.

#### 2.3 Report of the China Focal Point

The China Focal Point, Mr LI Wei, informed the meeting on the benefits that the China Meteorological Administration (CMA) had derived from hosting the intercomparison.

#### 2.4 Report from the Data Processing Expert for Scientific Sounding Instruments

The Data-processing Expert for Scientific Sounding Instruments, Dr Holger Vömel, informed the meeting on the collaboration that took place within GRUAN to analyse the results of

the Scientific Sounding Instrument (SSI). He stressed that for the climate community it is not only the performance of the sensors that are critical, but that an understanding of how the manufacturers come to the performance specifications of their instruments is also crucial.

### **3. 8<sup>th</sup> WMO INTERCOMPARISON OF HIGH QUALITY RADIOSONDE SYSTEMS**

The meeting agreed that the discussion held during the meeting and the preliminary results of the intercomparison were strictly confidential. The preliminary results of the intercomparison would only be shared in the form of the draft final report with the participants of the meeting of the International Organizing Committee for Upper-Air Observations (IOC-UA) which will be held in Payerne, Switzerland, from 29 to 31 March 2011 and that will include representatives of the manufacturers. The IOC-UA will have to formally approve the final version of the report.

#### **3.1 Presentation of the Draft Final Report**

3.1.1 Dr Nash presented in detail the way in which he carried out the analysis of the operational radiosonde systems. This included a detailed presentation on how the reference was determined for each meteorological parameter and how the two independent groups of radiosondes flown separately were linked together. He also presented detailed examples of limitations and problems encountered by some instruments under specific atmospheric conditions.

3.1.2 He mentioned that the use of the remote-sensing instruments had been critical for the evaluation to constrain the differences between the day and night performances and to understand the behaviour of the individual instruments under specific atmospheric conditions.

3.1.3 Dr Vömel presented the analysis of the SSI group and the problems that were encountered with some instruments.

#### **3.2 Discussion of the Draft Final Report and Drafting Session**

3.2.1 The meeting reviewed the procedures that were used for the analysis of the data and approved them.

3.2.2 The meeting also agreed on the general outline of the report and on how to present the results of the intercomparison in the individual chapters addressing separate meteorological variables, as well as in the conclusion chapter. The meeting decided that in the conclusion chapter a table would be included for the operational radiosondes that would provide a rating of the individual systems. The rating would be done for each meteorological variable separately to allow users to select those radiosondes that best meet their requirements.

3.2.3 The meeting recognized that the performances achieved in this intercomparison were specific to the conditions in which it was carried out and that well-trained operators were critical in achieving such performances.

#### **3.3 Review of Recommendations**

3.3.1 The meeting reviewed in detail all the conclusions and recommendations provided in the draft report of the intercomparison. In particular, the meeting addressed the quality standard expected from ordinary radiosondes and from radiosondes used for climate purposes.

#### **3.4 Approval of the Draft Final Report**

3.4.1 The meeting agreed that some further modifications of the draft final report needed to be done, to account for the discussions held during the meeting, before it could be shared with the IOC-UA members and participating manufacturers. The draft final report will be posted on a secure ftp website for review/comments by the manufacturers and IOC-UA members by 7<sup>th</sup> March 2011. They will be requested to provide their feedback by 24 March 2011, so that the project team will be able to review them before the IOC-UA-5 meeting.

#### **3.5 Plans for Publication of the Final Report**

The meeting agreed that the Final Report of the intercomparison should be published by the start of the Sixteenth WMO Congress.

### **3.6 Data Policy**

3.6.1 The meeting reviewed the data policy of the intercomparison and had no changes to make to it.

3.6.2 The meeting requested the China Focal Point to provide the courtesy statement that should be mentioned when remote-sensing data would be used in further analysis by third parties.

### **3.7 Summary of benefits for Members illustrated by examples**

The benefits of this intercomparison to Members were discussed and it was agreed this would be part of the conclusions of the report.

## **4. AGENDA FOR THE FINAL IOC MEETING**

The meeting reviewed the provisional agenda for the Meeting of the International Organizing Committee for Upper-Air Instrument Intercomparisons, Fifth Session (IOC-UA-5), planned to be held from 29 to 31 March 2011 in Payerne, Switzerland. The meeting agreed with the agenda as provided in Annex II to this report. The participants in the meeting decided to meet on 28 March together with available members of the IOC-UA to review the comments received and address the detailed planning of the meeting.

## **5. OTHER BUSINESS**

The meeting recognized that very significant contributions were made to the project both by Members, in particular the host country, and by manufacturers. It felt that it would be beneficial if WMO Members would be aware of these investments as it shows the interest and value that such intercomparison projects have for manufacturers and the private sector. Such projects could indeed only be achieved by collaborative efforts, but would not be achievable by a single Member. The meeting therefore recommended that the host country and manufacturers be asked to provide an estimate of costs encountered to host/participate in the intercomparison, both in terms of financial costs (investments, travel, hotel, ...) and man-power costs in man-days. These figures should be included as an Annex to the final report of the intercomparison.

## **6. DRAFT REPORT OF THE SESSION**

The meeting decided to adopt the report of the session by correspondence.

## **7. CLOSURE OF THE SESSION**

The meeting was closed on 18 February 2011 at 16:30.

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**PROVISIONAL AGENDA  
for the IOC-UA-5 Meeting**

- 1. ORGANIZATION OF THE SESSION**
    - 1.1 Opening of the Session
    - 1.2 Adoption of the Agenda
    - 1.3 Working Arrangements for the Session
  - 2. REPORT OF THE CHAIRPERSON**
  - 3. 8<sup>th</sup> WMO INTERCOMPARISON OF HIGH QUALITY RADIOSONDE SYSTEMS**
    - 3.1 Presentation of the Final Report
    - 3.2 Review and Approval of the Final Report
    - 3.3 Data Policy
    - 3.4 Publication of the Final Report
  - 4. RECOMMENDATIONS FOR FUTURE INTERCOMPARISONS**
  - 5. OTHER BUSINESS**
  - 6. DRAFT REPORT OF THE SESSION**
  - 7. CLOSURE OF THE SESSION**
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