

1st GRUAN Implementation-Coordination Meeting (ICM-1)
Norman, Oklahoma, USA
2-4 March 2009


Item 7.3

WMO Observing Systems and GRUAN standard procedures

(Submitted by M. Ondras (WMO Secretariat) and J. Nash (President of WMO CIMO))

Summary and Purpose of Document

This document provides a WMO perspective on how GRUAN standard procedures should be incorporated in the existing WMO regulatory material, if implemented as part of the WMO observing systems.



WMO Observing Systems & GRUAN Standard Procedures

1st GRUAN ICM, 2-4 March 2009

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Outline

How GRUAN should be incorporated in the below WMO Regulatory Material if implemented as a WMO Observing System:

- **Manual on the GOS**, (WMO-No. 544)
- **Guide on the GOS**, (WMO-No. 488)
- **CIMO Guide**, (WMO-No. 8)

GRUAN text to be included in:

Manual on the GOS

(WMO-No. 544)

Annex V to WMO Technical Regulations



Manual on the GOS

Volume I – Global Aspects

Part I: General principles

- Purpose of GRUAN
- Organization and Design of GRUAN
- Implementation of GRUAN

Part III: Surface-based Subsystem

- Composition of GRUAN
- Implementation of Elements of GRUAN
- Equipment and Methods of Observation applied for GRUAN

Volume I – Global Aspects

Part III: Surface-based Subsystem

Composition of the Subsystem

- Insert GRUAN under Climatological stations (GUAN)

Implementation of the Subsystem

- Networks of observing stations
 - Insert GRUAN
- Observing stations
 - Insert description and Members' obligation relevant to GRUAN
 - Location and composition of GRUAN (spacing, obs. Programme),
 - FRQ and timing of GRUAN observations

Volume I – Global Aspects

Part III: Surface-based Subsystem

Equipment and Methods of Observation

- General requirements of a GRUAN station
 - (e.g., siting and exposure, calibration, inspection, observers, etc.)
- General requirements of GRUAN instruments
 - (e.g., comparison and traceability)
- GRUAN observations
 - (e.g., details on how measurements and observations should be made for defined variables)

GRUAN text to be included in:



Guide on the GOS
(WMO-No. 488)

Part III: The Surface-based subsystem


- **Design of GRUAN network**
- **Planning of GRUAN network and stations**
- **Management of GRUAN network:**
 - Administrative arrangements and operational tasks,
 - Staff,
 - Logistics and supplies,
 - Establishment of new station,
 - Regular inspections,
 - Procurement of instruments,
 - Instrument check, maintenance, calibration,
 - Coordination, planning and budgeting,
 - Network performance monitoring.

Part III: The Surface-based subsystem

➤ **GRUAN Stations:**

- Siting and location,
- Observing & measurement area,
- Premises;
- Station staff,
- Staff training,
- Station identification,
- Telecommunications,
- Quality standards,
- Data processing and archiving,
- Etc.

GRUAN text to be included in:



**Guide to Meteorological Instruments
and Methods of Observation
(CIMO Guide)
(WMO-No. 8)**

Part I, Chapter 12

Measurement of upper air pressure, temperature, humidity

Insert text relevant to GRUAN into chapters:

- 12.1 General (Definitions, units, requirements, methods of measurements)
- 12.2 Radiosonde electronics
- 12.3 Temperature sensors
- 12.4 Pressure sensors
- 12.5 Relative humidity sensors
- 12.6 Ground station equipment
- 12.7 Radiosonde operations
- 12.8 Errors of radiosondes
- 12.9 Comparisons, calibration, maintenance
- 12.10 Computations and reporting procedures

Part II, Chapter 5

Special profiling techniques for the boundary layer and the troposphere

Insert text relevant to GRUAN into chapter:

5.2 Ground-based remote sensing techniques

- Acoustic sounders (sodars)
- Wind profiler radars
- Radio-acoustic sounding systems (RASS)
- Microwave radiometers
- Laser radars (lidars)
- Etc.