

**60th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 4: AIR NAVIGATION

**SITING, CALIBRATION AND MAINTENANCE OF AVIATION
METEOROLOGY INSTRUMENTS**

(Presented by DGCA India)

INFORMATION PAPER

SUMMARY

Aviation Meteorology not only contributes towards aviation safety but also to the economy, regularity and efficiency of air navigation. Meteorological (MET) information at airports such as weather observations, forecasts and warnings are primarily obtained from aviation MET instruments. DGCA-India recently issued a guidance material for Meteorological service provider regarding the installation, calibration and maintenance requirements of meteorological equipment at airports. The conference is invited to recognize India's efforts and encourage other APAC states to adopt similar practices.

SITING, CALIBRATION AND MAINTENANCE OF AVIATION METEOROLOGY INSTRUMENTS

1. INTRODUCTION

1.1 Aviation sector in India is witnessing a rapid growth both in terms of density of air traffic and in the number of airports. Meteorological Services Provider of every state carries out aviation meteorological observations and forecasts through establishment of sustained monitoring and warning systems, as per World Meteorological Organization (WMO) & ICAO standards and guidelines.

1.2 The MET instruments apart from human observations are predominantly utilized for MET observations and forecasts for providing MET services in air navigation. Apart from adapting ICAO Annex 3 SARPS in national regulations, the need for a consolidated guidance material for effective siting, calibration and maintenance of aviation MET equipment installed at the airport(s) was realized during the safety oversight of aviation Meteorological service provider in India.

1.3 The types and models of different MET instruments installed at airports vary with the requirements for forecasting and observations at each aerodrome. An accurate siting, timely calibration and effective maintenance are required for reliable readings from the MET instruments. Hence DGCA-India has released a guidance material, ANSS AC 1 of 2024 for siting, calibration and maintenance of Aviation MET instruments.

2. DISCUSSION

2.1 Aviation meteorological services in India are provided through a network of four Meteorological Watch Offices (MWOs) at Kolkata, New Delhi, Chennai, and Mumbai international airports, thirteen Aerodrome Meteorological Offices (AMOs) and eighty-eight Aeronautical Meteorological Stations (AMSs) situated at various national and international airports of the country.

2.2 Due to the vast territorial expanse of the country and by virtue of aircraft operations from islands at both Arabian sea and Bay of Bengal, various major weather phenomena ranging from cyclones, monsoon disturbances and FOG affect the airports and influence aircraft operations during different seasons of the year.

2.3 The meteorological information is primarily obtained from the aviation MET instruments installed within airports. The airports are equipped with manual and automated MET equipment for measuring, assessing, monitoring and remote indication of surface wind, visibility, runway visual range, air and dew-point temperatures and atmospheric pressure to support approach and landing and take-off operations. Integrated automatic MET systems are also installed at major airports for acquisition, processing, dissemination and display in real time of the meteorological parameters.

2.4 Met Service Providers are free to choose the type and variant of MET instruments based on their own criteria and requirements. Those MET instruments are then certified for aviation use by Met Service Provider or an accredited MET agency and thereafter installed at airports. During their operations life cycle at airports, the MET instruments are required to provide reliable performance for all surface meteorological observations of MET parameters. Therefore, the MET instruments are to be properly sited, calibrated and maintained for safe operations.

2.5 Correct siting of aviation MET instruments within an aerodrome, is crucial for obtaining accurate and reliable data. Proper siting ensures the MET measurements are representative of the conditions and meet the specific needs. Correct siting also helps prevent potential issues like erroneous data due to obstructions or environmental interference. Aviation MET instruments are required to be sited and installed at the correct locations so that the representative conditions of the aerodrome are accordingly ascertained and utilized for the safe aircraft operations.

2.6 The representative siting conditions as mentioned in guidance material are briefly as in following:

Meteorological element observed	MET equipment	Representative conditions
Surface wind Speed and direction	Anemometer and wind vane/ Ultrasonic Wind sensor	Representative conditions along the runway and touchdown zone
Air temperature	Thermometer	Representative condition of the aerodrome.
Atmospheric pressure	Barometer	Representative condition of the aerodrome.
Humidity/ Dew point	Hydrometer	Representative condition of the aerodrome.
Runway visual range (RVR)	Transmissometer and/or forward-scatter meter	Representative conditions of the runway.
Height of Cloud base	Ceilometer	Representative conditions of the runway threshold

2.7 Calibration of MET instruments is essential for ensuring accurate measurements and reliable results. Calibration helps minimize errors, extends instrument lifespan, and improves overall operational efficiency. The guidance material forms a ready reckoner for the MET service provider for timely calibration of MET instruments. The calibration schedule mentioned in DGCA-India's circular ANSS AC 1 of 2024 is as per following table.

Aviation MET equipment	Schedule of calibration
Anemometer and wind vane/Wind equipment	Once in six months
Thermometer	Once in a year
Barometer	Once in a year
Hygrometer	Once in a Year
Psychrometer	Once in a Year
RVR Instruments	Once in six months and prior to onset of FOG season
Ceilometers	Once in a Year

2.8 Access to MET instruments within the operational area of an aerodrome is vital for periodic maintenance and measurements. The guidance material mandates co-ordination between the MET service provider and the aerodrome operator for easy access to all MET sites within an airport as and when required.

2.9 The guidance material also specifies the frequency of inspections by the MET Service Provider personnel to the field sites where the MET instruments are installed guidance for maintenance of MET instruments.

2.10 The unique feature of the guidance material are the accountabilities mandated for the MET-officer in charge and the aerodrome operator of an airport. This will enable reliable operation of MET instruments at all times.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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