The Bureau of Meteorology

# MA2 – Certificate of Approval Policy

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## Contact us

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# Table of Contents

# Definitions

| Term | Description |
|---|---|
| **Aerodrome**[1] | means an area of land or water (including any buildings, installations, and equipment), the use of which as an Aerodrome is authorised under the regulations, being such an area intended for use wholly or partly for the arrival, departure, or movement of aircraft. |
| **Annex 3** | means Annex 3 to the *Convention for International Civil Aviation 1947*[2], which sets out the standards and recommended practices relating to meteorology for international air navigation. |
| **Applicant** | means a legal entity (a natural person or organisation) applying for a Certificate of Approval. |
| **Australian Bureau of Meteorology (Bureau)** | means the Commonwealth Bureau of Meteorology established by the *Meteorology Act 1955* (Cth). |
| **Australian Civil Aviation Safety Authority (CASA)** | means the authority called the Civil Aviation Safety Authority, established by the *Civil Aviation Act 1988* (Cth). |
| **Approval Process** | means the process, including associated guidance, which an Applicant must undertake to apply for a Certificate, as specified in the document entitled 'MA2 – *Certificate of Approval Policy*', published by the Meteorological Authority Office and updated from time to time. |
| **Automatic Weather Observing System (AWOS)** | means a fully integrated and configurable system of instruments, interfaces, processing, and transmission units that provides continuous, real-time information and measurements on aerodrome weather conditions. An AWOS includes but is not limited to: Automatic Weather Stations (AWS); Threshold Anemometers; Transmissometers (RVR systems); and Low-Level Wind Shear Systems. |
| **Automatic Weather Station (AWS)** [3] | means a meteorological station at which meteorological observations are made and transmitted automatically. |
| **Calibration**[4] | means:<br>(1) the experimental determination of the relationship between the quantity to be measured and the indication of the instrument, device or process that measures it; and/or<br>(2) the process of relating the indicated response of an instrument to its actuating signal or to the true value obtained independently; it is |

[1] Civil Aviation Act 1988, section 3
[2] Chicago, 7 December 1944 [1957] ATS 5
[3] WMO, 1992a
[4] WMO, No.49, Definitions

| Term | Description |
|---|---|
| | usually carried out at several points in the instrument's measurement range. |
| **CASR Part 91** | regulation 91 of the Civil Aviation Safety Regulations 1998. |
| **Certificate of Approval (Certificate)** | means an approval issued by the Bureau of Meteorology authorising a legal entity (organisation) to make weather reports from an AWOS. |
| **Certificate of Approval Holder (Certificate Holder)** | means in respect of an organisation, the director of that organisation or the director's authorised agent. |
| **Communications System** | means the communications equipment that comprises the network to transmit the meteorological observations or measurements from the AWOS to the intended recipient. |
| **Director of Meteorology (Director)** | means the Director of Meteorology. |
| **Exposition of Compliance (Exposition)** | means a document, or a set of documents, setting out the procedures and a system of quality assurance in order to comply with all appliable MET requirements stated in Part B of this document. |
| **First-in maintenance (FIM)** | means daily and/or weekly checks of an AWOS such as cleaning general upkeep, or specific tasks as detailed in the AWOS manufacturers documentation. |
| **Height**[5][6] | The vertical distance of a level, a point or an object considered as a point, measured from a specified datum. |
| **Inspection** | relates to those matters (in addition to routine maintenance) concerned with attaining meteorological observations of the highest standard. The purpose of performing an Inspection is to ensure the site, its surrounds, structures, and instrumentation, meets or exceeds all required minimum standards. |
| **Installation** | means the process of assembling, placing at a site, installing, and otherwise making available the AWOS so that the system is ready for use in accordance with its intended purpose. |
| **International Civil Aviation Organization (ICAO)** | means the United Nations specialized agency, established by States in 1944 to manage the administration and governance of the *Convention on International Civil Aviation 1947*. |
| **Maintenance** | means the periodic or routine testing, calibration, repair, and/or on-going maintenance of an AWOS, its associated systems and installation site. |

[5] ICAO, Annex 3, Chapter 1
[6] WMO, No.49, Definitions

| Term | Description |
|---|---|
| **Meteorological Aerodrome Report (METAR)** | means a routine aerodrome weather report issued at half hourly time intervals[7]. |
| **Meteorological Authority Office** | means the office within the Bureau of Meteorology which carries out certain functions for Australia in accordance with Annex 3 of *Convention for International Civil Aviation 1947*[8]. |
| **Meteorological Instrumentation** | means the instruments and equipment used to measure and record the values of meteorological parameters. |
| **Meteorological Observation**[9] | means the evaluation of one or more meteorological parameters. |
| **Meteorological Parameters** | means, but not limited to wind speed, direction, and gusts; air temperature; dew point temperature; relative humidity; barometric pressure; horizontal visibility; cloud height and coverage; present weather; rainfall; and runway visual range. |
| **Monitoring** | means to continuously observe and check the quality of the operational performance of the AWOS data output. |
| **Runway Visual Range (RVR)** [10] | means the range, measured using an electronic instrument, over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line. |
| **RVR System** | means the electronic instrument, equipment and systems used to measure Runway Visual Range. |
| **Special Aerodrome Weather Report (SPECI)** [11] | means a special aerodrome weather report issued only when meteorological parameters meet specific criteria. |
| **Threshold**[12] | The beginning of that portion of the runway usable for landing. |
| **Threshold Anemometer** | means an anemometer installed at the Threshold. |
| **Touchdown zone**[13] | The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway. |

[7] in the Australian context an ICAO format observation with Australian registered differences
[8] Chicago, 7 December 1944 [1957] ATS 5
[9] ICAO, Annex 3, Chapter 1
[10] CASR Dictionary
[11] in the Australian context an ICAO format observation with Australian registered differences
[12] ICAO, Annex 3, Chapter 1
[13] ICAO, Annex 3, Chapter 1

| Term | Description |
|---|---|
| **Transmissometer**[14] | An instrument that takes a direct measurement of the transmittance between two points in space, i.e., over a specified path length or baseline. |
| **Validation** | means the quality assurance process implemented to ensure meteorological information meets intended recipient's needs. |
| **World Meteorological Organization (WMO)** | WMO is the specialised agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences. |

[14] ICAO, Doc 9837, Chapter 2

# 1. Introduction

## 1.1. Background

Under CASR Part 91[15] the pilot in command of an aircraft for a flight must meet the flight preparation (weather assessments) requirements detailed in Part 91 (General Operating and Flight Rules) Manual of Standards[16]. These requirements state a pilot in command must study *authorised weather forecasts* and *authorised weather reports*. Civil Aviation Safety Regulations 1998 (Dictionary)[17] provides definitions of *authorised weather forecast* and *authorised weather report*:

> ***authorised weather forecast*** means:
>
> (a) other than in a foreign country—a weather forecast made by the Bureau of Meteorology for aviation purposes; or
>
> (b) in a foreign country—a weather forecast made by a person or body that holds an authorisation (however described), granted by an authority of the country, to provide weather forecasts for aviation purposes.
>
> ***authorised weather report*** means:
>
> (a) other than in a foreign country—a weather report made by:
>
> (i) the Bureau of Meteorology for aviation purposes; or
>
> (ii) an individual who holds a certificate from the Bureau of Meteorology to give weather reports for aviation purposes; or
>
> (iii) an automatic weather station at an aerodrome that is approved by the Bureau of Meteorology as an automatic weather station for the aerodrome; or
>
> (iv) an automatic broadcast service published in the AIP; or
>
> (v) an individual who holds a pilot licence; or
>
> (vi) a person appointed by an aerodrome operator to make runway visibility assessments under the Part 139 Manual of Standards; or
>
> (vii) a person included in a class of persons specified in the AIP for this subparagraph; or
>
> (b) in a foreign country—a weather report made by a person or body that holds an authorisation (however described), granted by an authority of the country, to provide weather reports for aviation purposes.

In accordance with paragraph (a)(i) of the *authorised weather report* definition, the Bureau makes weather reports, which are meteorological observations issued as METAR/SPECI.

In accordance with paragraph (a)(iii) of the *authorised weather report* definition, an AWS makes weather reports which may be provided to the Bureau for provision of METAR/SPECI.

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[15] https://www.legislation.gov.au/Series/F2018L01783
[16] https://www.legislation.gov.au/Series/F2020L01514
[17] https://www.legislation.gov.au/Series/F2019L00557

An organisation intending to make weather reports from an AWS for use by aviation must apply to the Bureau for approval.

## 1.2. Scope

This document applies to AWOS that make weather reports for local distribution at the aerodrome, and to AWOS that provide meteorological observations and/or measurements to the Bureau for input into METAR/SPECI, for use by aviation within Australia and its territories.

## 1.3. Purpose

The purpose of this document is to outline the process and requirements for the processing of an application for the granting of, or variation to, a Certificate.

The requirements are the criteria the Bureau would require an Applicant to meet in order to obtain a Certificate. The criteria are aimed at ensuring the Applicant will have: the supporting systems; effective procedures; robust instrumentation; suitable equipment; and qualified staff necessary to ensure aviation safety is not compromised.

## 1.4. Certificate Overview

### 1.4.1 What is a Certificate?

A Certificate is a permission granted by the Bureau to allow organisations to:

a. Make weather reports from an AWOS; and/or
b. Provide data from an AWOS to the Bureau for inclusion in METAR/SPECI.

### 1.4.2 Who needs a Certificate?

An organisation must obtain a Certificate in order to make weather reports from an AWOS for use by aviation.

An organisation must obtain a Certificate in order to provide meteorological observations and/or measurements from an AWOS to the Bureau for inclusion in METAR/SPECI.

### 1.4.3 Who may apply for a Certificate?

Any Australian legal entity, capable of enjoying and being subject to legal rights and responsibilities (such as entering into contracts) may apply for a Certificate.

## 1.5. Weather forecasts and METAR/SPECI (weather) reports

The Bureau's aviation meteorological service provides aviation users with meteorological information necessary for safe and efficient civil aviation operations. The service includes the provision of METAR/SPECI, forecasts, warnings, and advisories, and is provided within the technical and regulatory framework of ICAO.

The provision of aviation related services is managed by the Bureau's Aviation Land and Maritime Transport Program and is handled separately to the Meteorological Authority Office certificate process.

Applicants wishing to supply weather observations to the Bureau to facilitate these services should contact the Bureau's Aviation Land and Maritime Transport Program via email at webav@bom.gov.au to discuss the necessary data format and ingest requirements.

# Part A Approval Process

I require a Certificate? If so, refer to the Certification section.

I am a Certificate Holder? If so, refer to the Continued Validity section.

# 1. Certification

The certification process consists of three main phases: application, assessment, and certification.

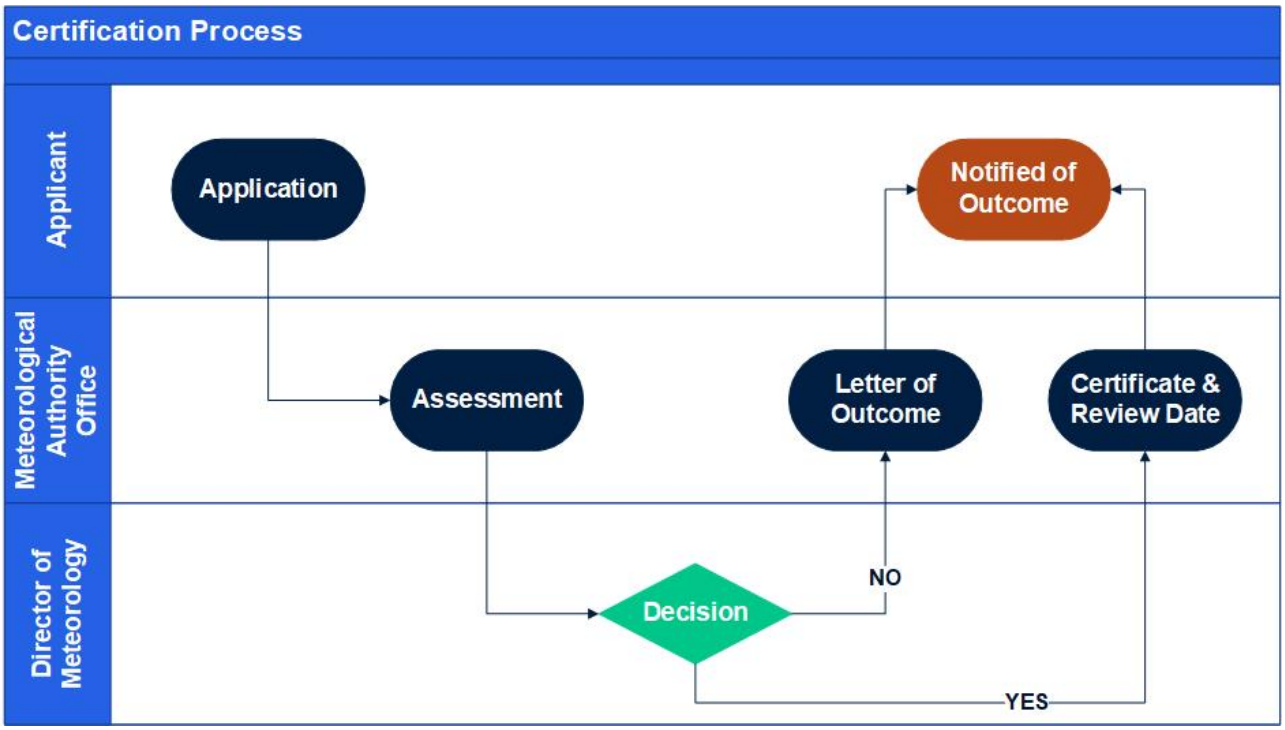


Figure 1 - Certification Process

## 1.1. Application phase

The Applicant must make an application to the Meteorological Authority Office using *MA3 - Application Form* and provide an Exposition. On receipt of the application the Meteorological Authority Office will:

i. provide the Applicant with the terms on which the Bureau may be willing to consider an application and grant a Certificate; and
ii. issue an invoice for payment of the application fee.

An application may be cancelled due to non-payment of the application fee.

The Applicant is solely responsible for communicating with any associated stakeholders or interested parties, such as aerodrome operators, about the progress and outcome of an application.

## 1.2. Assessment phase

The aim of the assessment phase is to verify the evidence provided by the Applicant in support of their application and to confirm if the AWOS(s), applied for in the application, can be operated in a satisfactory manner having regard to the requirements set out in Part B of this document. The assessment is carried out in two (2) stages:

1. Desk-top audit of the Exposition and, if requested by the Meteorological Authority Office, other documents (desk-top audit); and
2. Face-to-face audit to verify the operation and effectiveness of the Exposition and documents (audit).

More detailed information regarding the assessment phase is provided in Appendix 1.

## 1.3. Certification phase

An Applicant is entitled to a Certificate for the AWOS(s) applied for in the application if the Bureau is satisfied that:

i. the Applicant fulfils the requirements of Part B of this document; and
ii. the granting of the Certificate is not contrary to the interests of aviation safety.

A Certificate remains in force if the conditions of continued validity are met, or until it is suspended, terminated, or cancelled.

# 2. Continued Validity

Once a Certificate has been granted, the Applicant is referred to as the Certificate Holder.

To ensure the Certificate Holder continues to fulfil the requirements of Certificate, the Meteorological Authority Office will confirm, by means of scheduled audits, compliance with the requirements in Part B of this document. If a non-compliance with the requirements in Part B of this document or a breach of the terms of the Certificate is identified, an unscheduled audit may be required to validate the remediation. The Certificate Holder will be notified in writing of the requirement for an unscheduled audit.

Scheduled or unscheduled audits are at the expense of the Certificate Holder who is required to make available all necessary documents, records, and personnel.

The continued validity process consists of three main phases: application, assessment, and continued validity of the Certificate.

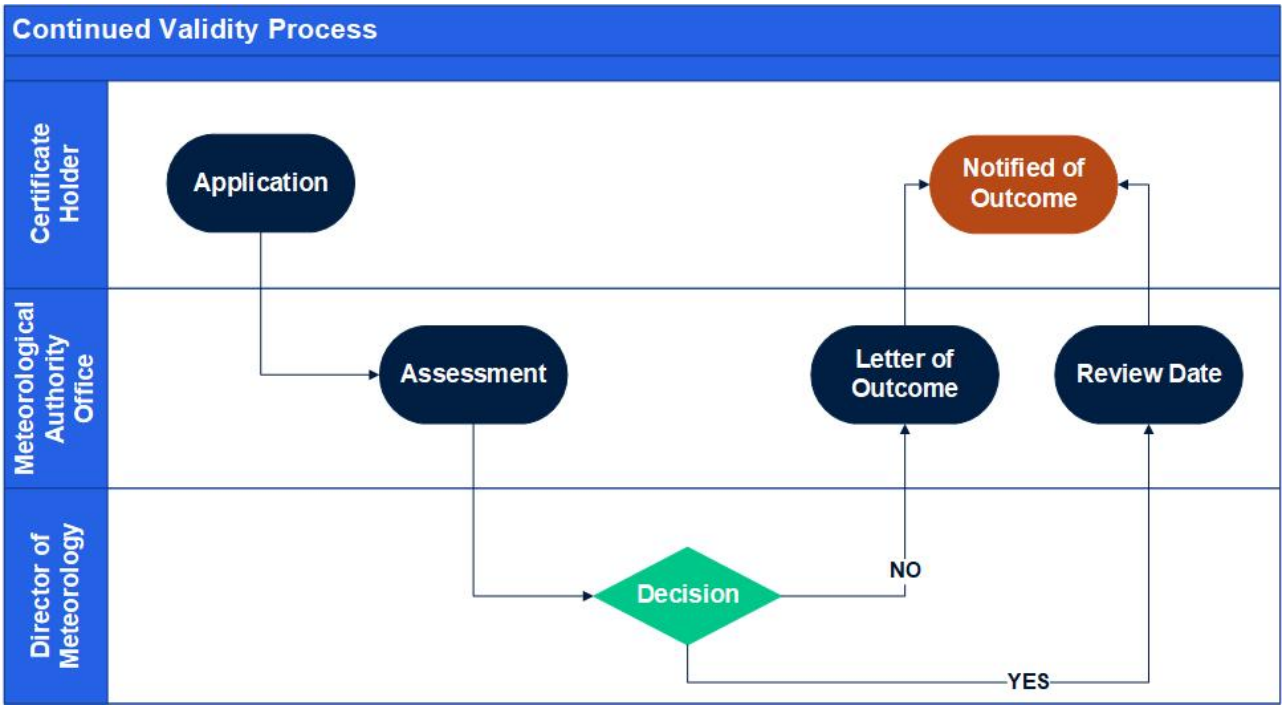


Figure 2 - Continued Validity Process

## 2.1. Application phase

Timing of scheduled audits will be at the discretion of the Meteorological Authority Office, a review date will be notified in writing to the Certificate Holder, either upon granting of a Certificate or following the outcome of the previous scheduled audit.

The Certificate Holder must apply for a scheduled audit no more than 30 days prior to the review date as notified in writing. An application to initiate a scheduled audit must be made on *MA3 - Application Form*. A Certificate may be terminated if the Certificate Holder does not apply by the review date.

## 2.2. Assessment phase

Refer to Part A, section 1.2 for details of the assessment phase.

## 2.3. Continued validity of the Certificate

The Certificate Holder is entitled to continued validity of the Certificate if the Bureau is satisfied that:

i. the Certificate Holder continues to fulfil the requirements of Part B of this document; and
ii. the granting of the Certificate is not contrary to the interests of aviation safety.

# 3. Cancellation or variation at the request of the Certificate Holder

## 3.1. Cancellation

On the receipt of signed request from the Certificate Holder the Bureau can cancel a Certificate. An application to cancel a Certificate must be made on *MA3 - Application Form*.

## 3.2. Variation

The Bureau can vary a Certificate at the request of the Certificate Holder.

A Certificate Holder may wish to amend their Certificate to:

1. add a new AWOS, including an additional AWOS at the same aerodrome; or
2. remove an existing AWOS.

An application for a variation must be made on *MA3 - Application Form*.

Applications to include new AWOS to the Certificate will be assessed in accordance with Part A, section 1.2, of this document.

The Certificate Holder is solely responsible for communicating with any associated stakeholders or interested parties, such as aerodrome operators, about the progress and outcome of a variation.

# Part B Certificate Requirements

The Applicant or Certificate Holder must have an Exposition that addresses the requirements set out in this Part.

## MET.1 AWOS location details

1. The Applicant must detail the location of each AWOS operated by the Applicant that makes weather reports for local distribution at the aerodrome, and/or each AWOS that provides meteorological observations and/or measurements to the Bureau for the provision of METAR/SPECI.

## MET.2 Personnel requirements

1. The Applicant must have:

   a. A senior person ultimately accountable for the AWOS(s) who:

      i. has the authority within the organisation to ensure that the AWOS(s) can be financed to fulfil the requirements in Part B of this document; and
      ii. will ensure the organisation complies with the requirements of Part B of this document; and
      iii. will liaise and coordinate activities with the Meteorological Authority Office; and
      iv. is the primary signatory on the legal contract between the Applicant and the Commonwealth.

   ***Note***: ii, iii and/or iv can be delegated to one or more senior personnel within the organisation. All delegations must be clearly stated.

   b. A person who has responsibility for MET.13 internal quality assurance and performance monitoring, who has direct access to the senior person responsible for MET.1 and functionally separate from the persons detailed in MET.2 (1)(a)(c) and (d).

   c. A person or persons authorised by the applicant to place each AWOS listed in MET.1 into operational service.

   d. Persons responsible for the maintenance of the AWOS(s) listed in MET.1.

2. The Applicant must detail the relevant qualifications and competencies required for the positions listed in MET.2 (1)(b), MET.2 (1)(c) and MET.2 (1)(d).

3. The Applicant must have a procedure to assess the competence of personnel in positions listed in MET.2 (1)(c) and MET.2 (1)(d).

4. The Applicant must have a procedure to maintain the competence of personnel in positions listed in MET.2 (1)(c) and MET.2 (1)(d).

5. The Applicant must have a procedure to ensure those personnel in positions listed in MET.2 (1)(c) and MET.2 (1)(d) are provided with written details of the scope of their authorisation

and/or responsibilities.

## MET.3 Siting requirements

1. The Applicant must have a procedure to ensure each AWOS listed in MET.1 is:

   a. securely sited to prevent unlawful or accidental interference; and

   b. provided with suitable power supplies and infrastructure to ensure the continuity of the service; and

   c. installed in accordance with the siting guidance, technical, restriction, and protection requirements found in relevant ICAO and WMO annexes and documentation; CASA Part 139 (Aerodromes) Manual of Standards 2019; CASA CAAP 92; the manufacturer specifications; Part D and/or Part C, RVR.1 of this Policy; and

2. Where applicable, the Applicant must have a procedure to complete the validation requirements found in Part C, RVR.2; and

3. The Applicant must have a procedure for the site acceptance and testing of all new installations, meteorological instrumentation, and/or meteorological instrumentation upgrades; and

4. The Applicant must have a procedure for the provision of installation checklists and site metadata to the Meteorological Authority Office in accordance with MA8 - *AWOS Installation Checklist and Metadata*.

## MET.4 Communication system requirements

1. The Applicant must have a procedure to ensure the communications system for each AWOS listed in MET.1:

   a. can provide meteorological observations and/or measurements for which it is intended; and, has a suitable power supply with supporting infrastructure to ensure the continuity of the service; and

   b. is appropriate for the required volume and type of meteorological observations and/or measurements being transmitted; and

   c. is securely sited and configured to prevent unlawful or accidental interference.

## MET.5 Meteorological instrumentation requirements

1. The Applicant must have a procedure to ensure that prior to installation, the meteorological instrumentation intended for use in each AWOS listed in MET.1 must comply with: the operationally desirable accuracy of measurement or observation; and the general specifications and guidelines for instrumentation systems required by ICAO for meteorological instruments intended for use at aerodromes.

## MET.6 Output requirements

1. The Applicant must have a procedure to identify the output of each AWOS listed in MET.1. The procedure must ensure:

   a. meteorological observations and/or measurements produced from each AWOS listed in MET.1 are identified and detailed, including the operational accuracy of measurement; and

   b. the output meteorological observations and/or measurements identified in MET.6 (1)(a) comply with, or exceed, the operational desirable accuracy of measurement for observations as stated by ICAO and, where applicable, Part C, RVR.3 and relevant Annex 3 Standards and/or Recommended Practices.

2. The Applicant must have a procedure to ensure recipients of the meteorological observations and/or measurements from each AWOS listed in MET.1 are consulted to determine the specific data format, data ingest, and/or data display requirements. The procedure must ensure that:

   a. the owner of each AWOS listed in MET.1 is identified, and contact information is kept up to date; and

   b. the recipients of the meteorological observations and/or measurements produced from each AWOS listed in MET.1 are identified, noting if applicable Part C RVR.3 (1)(a), and recipient contact information is kept up to date; and

   c. recipients of the meteorological observations and/or measurements produced from each AWOS listed in MET.1 are consulted to establish a mechanism to ensure delivery of meteorological observations and/or measurements from each AWOS to each recipient.

## MET.7 Documentation

1. The Applicant must hold a copy of the Exposition, all technical standards, instrumentation manuals or user guides, and any other material documentation relevant to each AWOS listed in MET.1.

2. The Applicant must have a procedure to control documentation identified in MET.7 (1). The procedure must ensure that:

   a. the documentation is authorised by appropriate personnel prior to issue; and

   b. current versions of relevant documentation are available to personnel at all locations where they need access to such documentation; and

   c. obsolete documentation is promptly removed from all points of issue or use; and

   d. changes to documentation are reviewed by appropriate personnel; and

   e. the current version can be identified to preclude the use of an out-of-date edition; and

f. updates or amendments to the Exposition are provided to the Meteorological Authority Office within ten (10) business days of issuance.

## MET.8 Maintenance requirements

1. The Applicant must have a procedure for maintenance of each AWOS listed in MET.1. The procedure must ensure that:

   a. Maintenance is scheduled and implemented as required by:

      i. the manufacturer of the meteorological instrumentation; and
      ii. the location or operating environment of the AWOS; and

   b. Appropriate inspection, measuring, or test equipment is made available to personnel for the testing of each AWOS listed in MET.1; and

   c. The inspection, measuring, or test equipment has the precision and accuracy necessary for the measurements and tests being carried out; and

   d. The inspection, measuring, or test equipment is checked and/or calibrated before use, or at prescribed intervals against certified equipment that has a documented chain of calibration, or comparisons, traceable to an accredited reference laboratory; and

   e. Each AWOS listed in MET.1 is calibrated to ensure it produces accurate meteorological observations and/or measurements; and

   f. The installation site of each AWOS listed in MET.1 is maintained to ensure representative meteorological observations and/or measurements; and

   g. Persons, including subcontractors, performing maintenance have:

      i. the qualifications required by MET.2 (2); and
      ii. been assessed as competent under the procedure required by MET.2 (3); and
      iii. been provided with the scope of their maintenance responsibilities as required under MET.2 (5).

2. The Applicant must have a procedure for the FIM of each AWOS listed in MET.1. The procedure must ensure that:

   a. FIM is scheduled and implemented as determined by:

      i. the manufacturer of the meteorological instrumentation,
      ii. the systems and/or equipment supporting the AWOS; and
      iii. the location or operating environment of the AWOS; and

   b. FIM requirements are identified, local aerodrome routines are established and are detailed in checklists; and

   c. Persons, including subcontractors, required to perform FIM have been identified, trained, and are assessed as competent to perform FIM; and

d. first-in maintenance responsibilities are communicated by the Applicant to persons competent to do so.

## MET.9 Operational service

1. The Applicant must have a procedure for placing each AWOS listed in MET.1 into operational service. The procedure must ensure:

   a. the person or persons identified at MET.2 (1)(c) have:

      i. the qualifications required by MET.2 (2); and
      ii. been assessed as competent under the procedure required by MET.2 (3); and
      iii. been provided with the scope of their responsibilities related to placing the AWOS into operational service as required under MET.2 (5); and

   b. where applicable, the validation requirements in Part C, RVR.2, of this document have been addressed to the satisfaction of the Meteorological Authority Office.

## MET.10 Operational status

1. The Applicant must have a procedure for notification of relevant AWOS operational information for publishing in the AIP-En-Route Supplement Australia (ERSA) [18]. The procedure must ensure:

   a. the entity responsible for advising Airservices Australia on the publication of operational information in ERSA is identified; and

   b. relevant operational information is provided to the entity identified in MET.10 (1)(a) for onforwarding to Airservices Australia for publication in ERSA.

2. The Applicant must have a procedure to notify of planned outages of each AWOS listed in MET.1. The procedure must ensure the recipients of the meteorological observations and/or measurements identified under the procedure required by MET.6 (2) are notified of all planned outages to the AWOS.

3. The Applicant must have a procedure to identify and notify of unplanned outages of each AWOS listed in MET.1. The procedure must ensure:

   a. the identification, investigation, and rectification of full or partial unplanned outages to the AWOS; and

   b. the recipients of the meteorological observations and/or measurements identified under the procedure required by MET.6 (2) are notified of any unplanned outage to the AWOS and are provided with regular status updates until rectification; and

   c. notification of any unplanned outage is provided to the entity identified in MET.10 (1)(a);

[18] For insertion in the respective *Meteorological Information Provided* FAC section

and

d. the Meteorological Authority Office is notified within 24 hours of an unplanned outage to an AWOS that cannot be rectified within 72 hours and provide a status update once the unplanned outage is rectified.

## MET.11 Data quality assurance

1. The Applicant must have a procedure for assuring the quality of meteorological observations and/or measurements produced by each AWOS listed in MET.1. The procedure must ensure:

   a. the identification, investigation, and rectification of erroneous observations and/or measurements produced by the AWOS; and

   b. the recipients of the meteorological observations and/or measurements identified under the procedure required by MET.6 (2) that have received erroneous observations and/or measurements are notified as soon as practicably possible or in accordance with any relevant agreements; and

   c. the notification of erroneous observations and/or measurements produced by the AWOS is provided to the entity identified in MET.10 (1)(a).

## MET.12 Checks after accident or incident

1. The Applicant must have a procedure for checking the accuracy of meteorological observations and/or measurements from an AWOS listed in MET.1 that may have been used by an aircraft involved in an accident or incident. The procedure must ensure:

   a. the required checks are carried out and documented as soon as practicable after notification to the Applicant's organisation of such an accident or incident; and

   b. copies of the meteorological observations and/or measurements are stored in a secure location for use as required by any subsequent investigation.

## MET.13 Internal quality assurance and performance monitoring

1. The Applicant must have a procedure for internal quality assurance to ensure compliance with, and the adequacy of, the procedures required by Part B of this document. The procedure must ensure:

   a. an internal quality audit, or a technical audit, of the procedures required by Part B of this document is carried out at an interval of no more than 12 months; and

   b. management reviews are carried out following each instance of 1(a) to ensure that:

      i. follow-up corrective and/or preventative actions are implemented; and
      ii. new or emerging risks (e.g., trends in unplanned outages and/or erroneous observations and/or measurements for each AWOS listed in MET.1) that may impact the operation of each AWOS listed in MET.1 are identified and actions to address these risks are documented.

## MET.14 Records

1. The Applicant must have a procedure for the management, retention, and disposal of records necessary for the Certificate. The procedure must ensure:

   a. records of all meteorological observations and/or measurements produced by each AWOS listed in MET.1 are retained for a minimum period of 60 days; and

   b. there are records of validation requirements as required under MET.3 (2); and

   c. there are records of site acceptance tests as required under MET.3 (3); and

   d. there are records of site metadata as required under MET.3 (4); and

   e. there is a record as required under MET.5 (1) of the manufacturer's certification, and/or an independent testing report from an accredited laboratory for the meteorological instrumentation installed in each AWOS listed in MET.1; and

   f. there are records of maintenance as required under MET.8 (1)(a)(e) and MET.8 (2)(a)(b); and

   g. there is a record of the inspection, measuring or test equipment and their associated calibration as described by the procedure required by MET.8 (1)(d); and

   h. there is a record of all unplanned outages identified under the procedure required by MET.10 (3), including a description of the investigation into the unplanned outage and the actions taken to rectify; and

   i. there is a record of each identification of erroneous meteorological observations and/or measurements required by MET.11 (a); including, a description of investigation into the erroneous meteorological observations and/or measurements, and the actions taken to rectify; and

   j. there is a record of each internal quality audit, or technical audit, carried out under the procedure required by MET.13. The record must detail the procedures audited, the findings of the audit, and any necessary follow-up corrective and/or preventative action taken; and

   k. there is a record of each management review carried out under the procedure required by MET.13. The management review record must detail status updates on follow-up corrective and/or preventative actions, identified risks and actions to address them; and

   l. there is a record of the qualification(s) and competency of personnel identified under MET.2 (1)(b), MET.2 (1)(c) and MET.2 (1)(d).

   m. there is a record of the training undertaken and the competency status of personnel identified to perform FIM under MET.8 (2)(c).

2. The Applicant must have a procedure for the provision to the Meteorological Authority Office

of a report in relation to the operation of each AWOS listed in MET.1. The procedure must ensure the provision of the following records at the stated frequency:

| Record detailed in MET.14 | Frequency of submission |
|---|---|
| b. validation records | as required based on AWOS installation |
| c. site acceptance test records for all new installations, meteorological instrumentation, and/or meteorological instrumentation upgrades or installations. | within four (4) weeks of the AWOS installation or upgrade |
| d. site metadata records | MA8 checklist prior to, and final Metadata on installation of the AWOS. Or, on occurrence when a change is detected, or when new or replacement instrumentation is installed. |
| e. the manufacturer's certification, and/or an independent testing report for the meteorological instrumentation. | prior to installation of new meteorological instrumentation |
| f. maintenance records for each meteorological instrument installed at the AWOS | within four (4) weeks of each site visit |
| g. calibration records for all inspection, measuring, or test equipment | annually, or following each calibration event |
| h. unplanned outage records | annually, or on occurrence, or as requested |
| i. erroneous information records | on occurrence |
| j. internal audit record | within four (4) weeks of issue |
| k. management review records | within four (4) weeks of issue |
| m. training and competency records of all FIM personnel | annually, or as requested, or within four (4) weeks of each site visit |

# Part C RVR System Requirements

A Transmissometer is the only approved meteorological instrument to measure RVR.

## RVR.1 Siting requirements

1. Transmissometers[19] should be installed to provide assessments that are representative of a pilot's viewing position on the runway centre line. Therefore, a Transmissometer should be:

   a. installed to ensure the height of the optical path is approximately 2.5 m (7.5ft) above the runway; and

   b. installed at the necessary zones determined by CASA. This may include the Touchdown, the Mid-point and/or Stop-end zone of the runway, located as below; and

| | |
|---|---|
| Touchdown | approximately 300 m along the runway from the Threshold |
| Mid-point | approximately 1000 to 1500 m along the runway from the Threshold |
| Stop-end | approximately 300 m from the other end of the runway respectively |

   c. located not more than 120 m laterally from the runway centre line.

2. Additional considerations for the siting of Transmissometers:

   a. The aerodrome operator may determine additional Transmissometers are required to support other operations or may wish to install additional Transmissometers other than those required as per RVR.1 (1)(b).

   b. The exact position of Transmissometer sites, and as necessary additional Transmissometers, should be decided after considering aeronautical, meteorological, and climatological factors, for example long runways, location of navigation aids, adjacent structures, or fog prone areas.

   c. Since RVR cannot be measured directly on the runway, the error caused by the difference in conditions at the runway and at the location where the RVR is assessed can have an operational impact. Therefore, any deviation from the siting requirements stated at RVR.1 must be approved by the Meteorological Authority Office in accordance with paragraph RVR.2 (1)(a).

## RVR.2 Validation requirements

1. Validation of RVR System requires the following:

   a. prior to installation of the RVR System, Applicants must obtain approval from the Meteorological Authority Office of the proposed aerodrome siting of the RVR System. The

[19] Airservices Australia – AIP ENR 1.5 -30, 4.2.1

Meteorological Authority Office will conduct a review of the proposed siting in consultation with CASA. The Meteorological Authority Office will use the Siting Requirements set out in RVR.1 to assess the proposed siting of the RVR System but may also approve deviations from the requirements in RVR.1 in its reasonable discretion; and

b. Applicants must provide (to the reasonable satisfaction of the Meteorological Authority Office) a test report from the equipment manufacturer that documents the process that confirms the Transmissometer(s), intended for installation at the Aerodrome, provide the operationally desirable accuracy of measurement; and

c. after installation of the RVR System, Applicants must provide a test report detailing satisfactory results of the Transmissometer(s) calibration or installation testing completed by personnel who are approved by the Applicant to place the RVR System into operational service; and

d. after installation of the RVR System, Applicants must provide a report from a licensed surveyor demonstrating the siting of each Transmissometer as approved in paragraph RVR.2 (1)(a), or documenting any deviation from the approved siting; and

e. any additional documentation reasonably requested by the Meteorological Authority Office.

## RVR.3 Output requirements

1. An RVR System must:

a. provide data to the relevant Meteorological Service Provider; and

b. flag, remove, or not provide data in the event of malfunction or erroneous information; and

c. report values of RVR that are updated at least every 60 seconds and are available within 15 seconds of the end of the averaging period; and

d. report values of RVR using the maximum light intensity available on the corresponding runway. Or, if interfaced with the runway lighting system, report RVR values adjusted to the selected light intensity.

# Part D AWS and Anemometer Requirements

In addition to the siting requirements stated below, Applicants can source additional information on siting of meteorological instrumentation at aerodromes from relevant ICAO and WMO documentation. Specific guidance related to the siting of an instrument enclosure can be found in the CASA Part 139 (Aerodromes) Manual of Standards, Chapter 19, Sections 19.17 and 19.18.

## AWOS.1 General AWS requirements

1. Meteorological observations[20] should be representative of the conditions at or near the aerodrome, an individual runway, or the runway complex[21]; and

2. Meteorological instrumentation or their operation must not present hazards to air navigation; and

3. The presence or movement of aircraft at the aerodrome and the various aerodrome installations must not unduly influence the measured values[22] from meteorological instrumentation; and

4. All meteorological instrumentation at an aerodrome, shall where possible be sited so as not to encroach upon the obstacle restriction area[23]. An assessment of the proposed installation must be made by the Aerodrome Operator in consultation with CASA; and

5. Helicopter training areas and airspace usage that would disturb the natural air flow near the meteorological instrumentation must be avoided[24]; and

6. Anticipated or planned infrastructure changes to the aerodrome must be considered when selecting a site for exposure of meteorological instrumentation.

## AWOS.2 Anemometer requirements

1. Anemometers providing data for the aerodrome[25] must be sited to provide representative wind measurements of the conditions above the overall aerodrome; and

2. The standard exposure of wind instruments over level, open terrain shall be 10 m above the ground[26]. Open terrain is defined as an area where the distance between the anemometer and any obstruction is at least 10 times the height of the obstruction (1:10).[27] This exposure, while adequate, places the anemometer within the zone of influence of an obstruction when the winds

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[20] means the evaluation of one or more meteorological parameters.
[21] An aerodrome with multiple runways.
[22] WMO-No.8 (2017), Part II, Observing Systems, Chapter 2, 2.1.3.
[23] CASA Part 139 (Aerodromes) Manual of Standards, Chapter 7, provides definitions, guidance and requirements on Obstacle Restriction and Limitation.
[24] Airservices Australia, Aeronautical Information Circular (H30/17) Aircraft Wake Turbulence, pages 3-4.
[25] Wind data for inclusion into METAR/SPECI
[26] ICAO, Doc 8896, Appendix 2, 5.5.1 and Table A2-3 - *Surface wind speed and direction.*
[27] WMO-No.8 (2017), Part I, Chapter 5, 5.9.2.

are of a moderate speed. For greater accuracy, a clear zone of 30 times (x30h) the height of the obstruction is recommended[28]; and

3. Anemometers must never be installed on the roof of a building, such as a control tower[29].

4. A runway threshold anemometer[30] should be installed:

   a. in open terrain; and

   b. between 100 m and 300 m longitudinally from the runway threshold; and

   c. at a lateral distance of between 120 m and 220 m from the runway centre line;

   and, where applicable, complies with the following minimum clearances:

   d. 150 m from the closest edge of turning areas and aprons; and

   e. 75 m from the closest edge of taxiways.

[28] Bureau of Meteorology, Observation Specification 2013.1, (1997), paragraph 3.5.1.3.
[29] ICAO, Doc 9837, Chapter 3, 3.4.2.3.
[30] Applicants must consult with the aerodrome operator and Airservices Australia when installing a threshold anemometer. An installation must comply with the Obstacle Restriction and Limitation requirements as stated in CASA Part 139 (Aerodromes) Manual of Standards.

# Appendix 1

## A1 Assessment Phase

### A1.1 Desk-top audit

The Meteorological Authority Office will assess the Applicants Exposition and any requested documentation to determine compliance with Part B of this document, or in the case of variation a sub-set of Part B of this document.

The purpose of this assessment is to establish the documentation provided by the Applicant satisfies the requirements in Part B of this document.

### A1.2 Audit

An audit will be conducted with the Applicant to verify that what is stated in the Exposition is being implemented and may include:

- Verifying the integrity of the documentation provided by the Applicant.
- Requesting further documents and/or information.
- Observing the Applicant's procedures.

Verification may be achieved through additional means including:

- site visits, interviewing aerodrome staff, and observing local procedures related to the AWOS; or
- by obtaining independent documentation; or
- unscheduled audits.

The Applicant is required to:

i. make all necessary documents, records, and personnel available; and
ii. arrange site visits as required; and
iii. pay the fees prescribed (*refer to MA13 - Fee Schedule*); and
iv. review the draft audit report and provide remediation plans for all identified non-compliances within 14 business days of the date of receipt of the draft report from the Meteorological Authority Office. Failure to engage with the Meteorological Authority Office may result in cancellation of the application; and
v. submit an application for a scheduled audit no more than 30 days prior to the review date.

The Meteorological Authority Office will:

i. consult with the Applicant to arrange the audit; and
ii. not disclose confidential information provided by the Applicant for the purposes of the audit without the prior written approval, except for disclosure to the following:
    a. subject matter expert/s involved in the audit;
    b. Bureau personnel who are directly involved in the management of the approval process;
    c. external auditors of the Meteorological Authority Office; or
    d. to appropriate persons as authorised or required by law to be disclosed.

iii. provide a draft audit report to the applicant for review within 14 business days of the audit date; and
iv. finalise the draft audit report and supply a copy to the Applicant for their records; and
v. make a recommendation to the Director or Delegate for a decision on:
    a. granting of the initial Certificate, or
    b. in the case of an application for variation, a variation to the Certificate; or
    c. in the case of a scheduled or unscheduled audit, a decision on continued validity of the Certificate.
vi. notify the Applicant in writing of the outcome from the decision process, and:
    a. if granted a Certificate;
        i. provide the Certificate; and
        ii. notify the review date.
    b. in the case of an application for variation, if granted provide a variation to the Certificate, or
    c. in the case of a scheduled or unscheduled audit, if granted continued validity of the Certificate, notify in writing the review date.