NAV CANADA

Serving a world in motion
navcanada.ca

Automated Weather Observation System

FREQUENTLY ASKED QUESTIONS

WHAT IS AN AWOS?

An Automated Weather Observation System (AWOS) provides continuous, real-time weather condition information and reports official observations for aviation.

AWOS disseminates weather information in a variety of ways:

- Observation information is transmitted via telecommunication circuit and published internationally in aerodrome routine hourly (METAR) and special (SPECI) meteorological reports.
- Real-time information is updated every minute and processed through the Voice Generator Sub-System (VGSS) for broadcast over a local VHF radio frequency that pilots can tune into in the vicinity of an airport; and/or
- Real-time information is sent to interfacing air traffic management systems providing situational awareness to local and remote NAV CANADA Operations staff.

WHAT DOES AN AWOS LOOK LIKE?

All NAV CANADA AWOS installed across Canada have the same layout. The Automated Weather Observation System collects weather data from a suite of sensors normally installed on the airfield away from obstructions. A field data collection unit sends the sensor feed to the data processing unit indoors which applies certified algorithms and quality assurance checks. The resulting weather observation and real-time data are sent to different systems for users to access.

System components include:

- Ice-free ultrasonic wind sensor
- Visibility and present weather sensor
- Laser cloud height sensor
- Ice accretion sensor
- Temperature and relative humidity sensor
- Barometer
- Tipping bucket rain gauge with wind shield
- Field data collection unit
- Data processing unit
- VHF voice broadcast (VGSS) – optional
- Supplemental weather cameras

WHAT INFORMATION DOES AN AWOS PROVIDE TO PILOTS?

An AWOS collects and verifies data which is then formatted into METAR and SPECI weather reports. These fully automated surface weather observation reports contain the following elements:

- Wind speed and wind gusts, wind direction (from which the wind is blowing) and variable wind direction; measured 10 meters above ground
- Visibility
- Runway visual range (where airports are equipped)
- Precipitation type and intensity
- Obstruction to vision
- Sky condition (cloud height and amount that has passed directly over the sensor, integrated over time)
- Temperature and dew point
- Altimeter setting
- Remarks including icing, wind shift, lightning, precipitation amount in the past hour, pressure rising/falling rapidly, sea level pressure, and missing sensor/data status
- Thunderstorm activity within the Canadian Lightning Detection Network

HOW DEPENDABLE IS AN AWOS?

The NAV CANADA AWOS provides accurate and reliable reporting of essential aviation weather parameters. They have been built using state of the art technology and comply with Transport Canada standards and NAV CANADA requirements.

All systems perform under most extreme weather conditions such as blizzards, extreme cold temperatures and coastal environments and are designed to report thunderstorms, freezing precipitation, freezing fog and snow events.

All systems comply with aviation weather observation and forecasting standards in accordance with the Transport Canada exemption to Canadian Aviation Regulations (CAR) 804.01(c), the World Meteorological Organization (WMO), the International Civil Aviation Organization (ICAO), and the Manual of Surface Weather Observation Standards (MANOBS).

HOW MANY NAV CANADA AWOS ARE INSTALLED IN CANADA?

AWOS are a core component of NAV CANADA's weather reporting infrastructure and operate at over 100 sites across Canada.

WHAT ARE THE BENEFITS?

An AWOS allows for weather information availability in remote and northern sites across Canada where human aviation weather observation would otherwise be limited or unavailable.

AWOS information can be used as an aid to human aviation weather observation during hours of operation at a site and then switched to fully automated observation outside operating hours to provide continuous dissemination of weather information.

IS AWOS INFORMATION RELIABLE?

NAV CANADA AWOS have been continuously and thoroughly tested in Canada. Testing was conducted in Iqaluit for extreme cold temperatures and high winds, in St. John's for freezing precipitation, high winds, fog and a salty atmosphere, and in Ottawa for demonstrations to Transport Canada.

Independent weather observers were hired during 329 days of inclement weather at both sites to perform observations to be used for comparison against the AWOS.

A third-party data analysis was completed to verify compliance of AWOS performance to the Government of Canada standards.

AWOS operation is continuously monitored and the system receives updates as required to improve reliability and performance.

ARE THERE ANY LIMITATIONS TO AWOS?

At all NAV CANADA AWOS locations, web-based weather cameras are installed and can be used by users to augment observations under certain meteorological conditions. At present, due to sensor limitations, automated systems are unable to report the following conditions:

- Shallow or patchy fog
- Smoke
- Tornadoes
- Precipitation that is not in the form of rain or snow, such as hail, snow grains, snow pellets, and ice crystals or multiple forms of precipitation falling at the same time (these are reported as Unknown Precipitation – UP)
- Drizzle (reported as rain)
- Depth of new snowfall
- Cloud type
- In extremely rare circumstances, heavy fog could be interpreted as rain and under freezing conditions could be reported as freezing rain

Research is on-going to develop the capabilities of the automated stations to detect many of these phenomena.

DO OTHER COUNTRIES OPERATE AWOS FOR AVIATION WEATHER INFORMATION DISSEMINATION?

Thousands of automated systems have been successfully deployed at airports throughout the United States (called Automated Surface/Weather Observing Systems, or ASOS) and abroad.

ABOUT NAV CANADA

Since 1996, NAV CANADA has been responsible for helping civil aircraft safely navigate the 18 million square kilometres of Canadian airspace and the North Atlantic oceanic airspace under Canada's control. One of the world's largest air navigation service providers, we oversee more than 3.3 million flights a year through a sophisticated network of area control centres, air traffic control towers, flight service stations, flight information centres and navigation aids across the country.

For more information about NAV CANADA and Canada's air navigation system, visit navcanada.ca