

AUTOMMA CHOICE

A fully unmanned and modular weather-observing air traffic control solution is about to be rolled out across Italy

Over the past few years, Italy's air traffic service provider, ENAV, and its subsidiary, Techno Sky, which is responsible for the management, operational support and maintenance of systems and equipment, have worked closely together to enhance the skills and know-how of both companies in many technical and operational areas of Italian air traffic control.

ENAV's experience in aeronautical meteorology, alongside Techno Sky's technical and engineering knowledge, helped to develop a new integrated weather system, called E-AWOS (ENAV Automatic Weather Observing System). E-AWOS deployment is underway at all national airports under the responsibility of ENAV and will provide real-time meteorological data and automate most of the daily processes previously carried out by weather observers.

The E-AWOS system is both flexible and modular. It can be easily integrated into new or existing networks at airports. It can also be easily customized to meet the changing operational needs and functions of weather observers at airports. Furthermore, the system can be easily upgraded to meet any changes in local and international standards and recommended practices (SARPs).

E-AWOS SYSTEM IMPROVEMENTS

Over the past year, a new set of requirements, derived from ENAV's operational needs, led to the further improvement of E-AWOS.

One of those improvements is the ability of the system to run in a fully unmanned way. The system automatically detects significant climatic variations in the airport and surrounding area, and then broadcasts this information through automatic meteorological reports to all stakeholders using an AFTN communication network.

The goal now is to provide all of ENAV's airports with a fully unmanned E-AWOS solution, which includes as a minimum, a set of sensors, such as a thermo-hygrometer, barometer, wind sensor, ceilometer, present weather detector, visibilimeter and lightning detection system. This will enable the system to automatically issue METAR/SPECI weather reports, local routine reports (Met Report) and local special reports (Special).

To achieve this, two distinct phases have been scheduled for ENAV E-AWOS: the former aimed at managing and validating automatic METAR/SPECI reports and the latter for the Met Report/Special.

Basic rules have been adopted according to ICAO recommendations to generate weather reports and advisories using data collected from sensors. These rules have been refined in order to improve the quality of the data, to reduce potential errors and to limit inconsistencies between consecutive reports.

THE TESTING PHASE

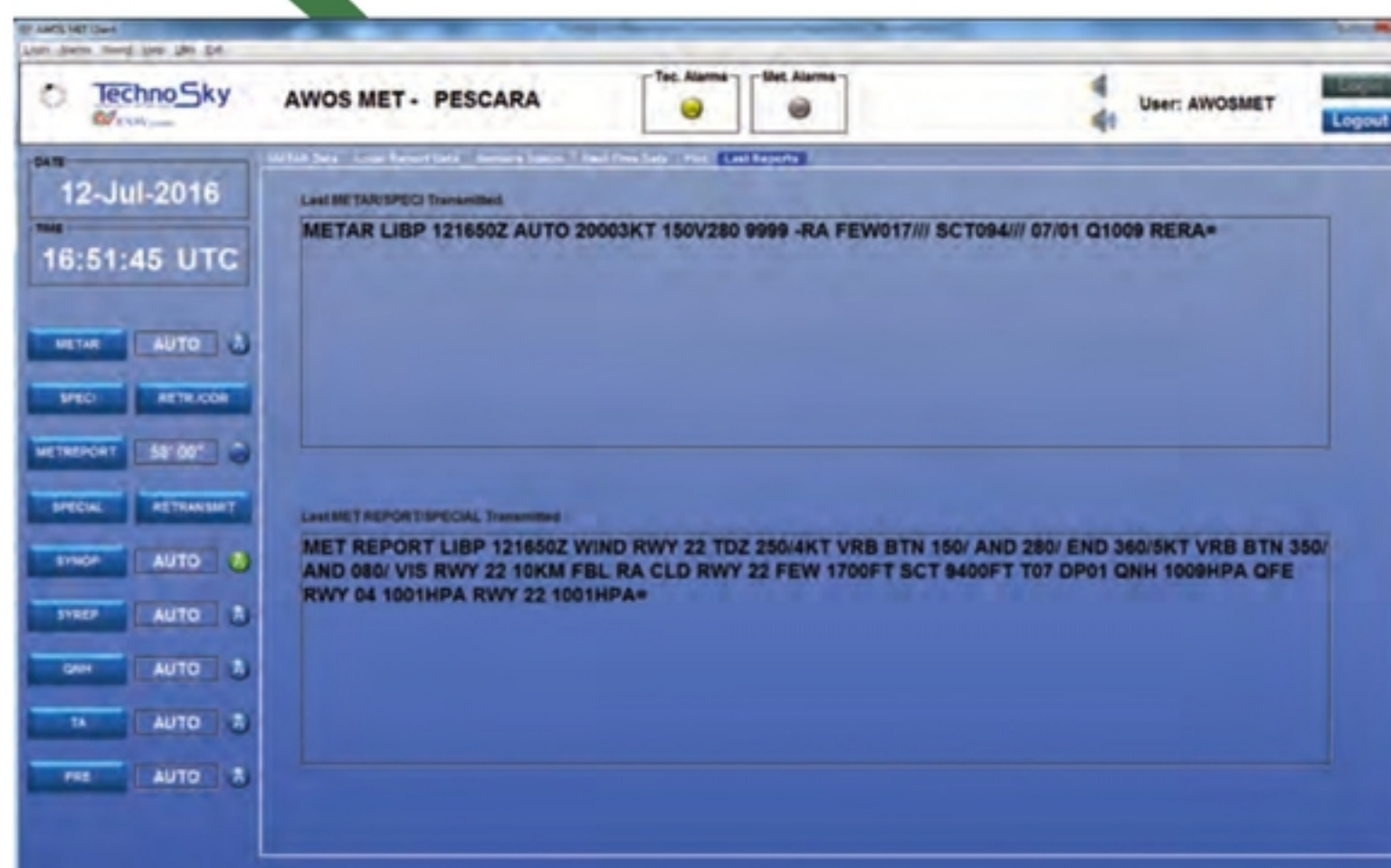
During testing, ENAV completed analysis of the performance of the automatically

generated METAR/SPECI reports, which looked at detected weather data such as cloud coverage, vertical and horizontal visibility, weather phenomena and air temperature. In some weather scenarios, such analysis pointed out contrasting phenomena detected by sensors, which is typically caused by their technological limitations, and a high number of SPECI reports in a short period. To overcome this, meteorologists and weather experts worked together to develop criteria for the E-AWOS system, which ensures that the data used from sensors is accurate, and in the event that data is not correct, it is corrected or deleted to ensure report consistency.

The integration of such criteria, which included the adoption of complex regulations and specific parameters, enabled E-AWOS to increase the number of valid automatic METAR/SPECI reports.

Field testing was also carried out for the system. Abruzzo Airport in Pescara was chosen as the pilot test site. The aim was to fine-tune the E-AWOS solution to the point where very effective results could be generated. The field test ended in February 2016 and now a fully unmanned version of E-AWOS is up and running at the airport during operational night hours, sending METAR and SPECI reports in automatic mode. All pilots and other stakeholders are made aware via NOTAM that such bulletins are fully operational, despite limitations in

TIC



↑ Last METAR and Met Report transmitted in E-AWOS

detecting lightning and phenomena, which are coded with 'TS'.

A specific paragraph was also inserted into the Italian aeronautical information publication, *AIP GEN 3.5*, which reported that in the presence of automatic METAR/SPECI reports, users have to remember that information on visibility, current weather and cloud reports from automated systems should be treated considering the actual sensors' technical performances, together with the reduced area sampled (when related to human eyes assessments) and the associated algorithms employed by the observing system.

IN OPERATION

Today, after several months of observation and report analysis, the unmanned version of E-AWOS is now also operational in Treviso International Airport, where automatic METAR/SPECI reports are used to provide weather observation during ENAV's met service closing hours. Other ENAV airports will start using the E-AWOS system in the forthcoming months, following the deployment program.

The next challenge will see ENAV and Techno Sky engaged in completing automatic METAR/SPECI reports for thunderstorms and with the issuing of automatic Met Report/Special for air traffic control officers and the automatic terminal information service system. ■

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↓ Sensor network display in E-AWOS

↑ METAR weather data display in E-AWOS

