Assessing meteorological observation requirements for a new airport

Challenge
St Helena is a unique and beautiful small volcanic island located in the South Atlantic Ocean, where trade winds are prevalent for most of the year making the weather changeable on a daily basis. It is one of the most remote locations in the world. In 2011, the St Helena Government contracted for the design, construction and operation of an airport to provide air access to St Helena for the first time from 2016.

The Met Office was asked by the Department for International Development (DFID) to provide a report for the St Helena Government on the meteorological requirements for the future airport. They wanted a detailed assessment of the existing weather observing equipment, followed by guidance and advice on the additional sensors and instrumentation required to provide aeronautical reports in compliance with International Civil Aviation Organisation (ICAO) standards and recommended practices defined by the ICAO.

Solution
We worked closely with the St Helena Government to produce a detailed analysis of the weather observing equipment in place, focussing on the requirement of developing the capability of the Airport to deliver accurate operational weather observations for aviation in the future. Accurate observations are also very important to ensure accurate forecasting for the airlines using the airport.

Based on our analysis, we gave advice on the best locations for siting meteorological instrumentation that measures wind conditions, visibility, cloud, temperature, humidity and air pressure, including the data they should supply in order to generate the aviation observations.

Benefits
We were able to provide a detailed report as a result of this assessment for the St Helena Government. This included recommendations for best practices to deliver safe, compliant and accurate weather observations for a new airport based at a remote location.

We were able to incorporate other findings arising from our analysis to highlight other risks that were not previously anticipated. We identified that the approach to St Helena was likely to lead to aircraft encountering significant crosswinds and low level turbulence on occasions, and advised that a mechanism for relaying accurate crosswind and tailwind information was required, for both pilots and air traffic control units.

Good quality weather observations will provide confidence to airlines in terms of the data provided and improve the efficiency at the airport.