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## Smart Radio: Real-time remote system-monitoring increases reliability and reduces maintenance work on site

Voice communication is the backbone of air traffic control. Air traffic controllers instruct pilots via “voice” on headings, speed or level changes or all other information which needs to be conveyed and acquitted immediately. Skyguide is currently deploying its new Smart Radio System by which all elements in the voice receiver system are constantly and remotely monitored. If a technical problem occurs, we know right away and can take the necessary steps to resolve it without loss of time.

The voice communication infrastructure of skyguide in western Switzerland consists of two main elements. A transmitter station at La Dôle and a receiver station at Le Cunay at 1600 Meters above sea level and 35 km from the Geneva control station and airport.

The radio stations serve as a so-called “experimental stations” for testing and adjusting the new radio equipment for the Smart Radio project – in particular a new functionality called “Remote Control and Monitoring System”.

Skyguide first deployed this highly advanced system for testing and adjustment purposes for two dedicated radios in Western Switzerland. These radios continuously monitor the performance of the frequency of all airplanes approaching Geneva airport. Each time an air traffic controller transmits a radio message, the system evaluates several parameters, such as the quality of the transmission in terms of frequency precision, modulation index (speech strength), field strength (radio energy sent into the air) and other data relevant for the radio link quality.

Skyguide is now able to remotely monitor the entire communication loop, from the controller’s microphone back to his headset, covering all intermediate elements such as the antennas, cables and other high frequency components by using new implemented software measurements from the new SMART Radio receivers.

With a permanent eye on all the relevant live parameters of the radio chain, Skyguide can track a possible parameter drift leading to unforeseen failure and monitor if the radio system works within the legal requirements.

The full deployment of this new SMART Radio System will lead to an overall reduction of the required maintenance effort on site, both directly and indirectly, since visits to the remote radio stations have to be conducted less frequently. Currently, the experimental system is also available at two locations of Zurich airport. This allows also to adapt the entire maintenance concept.