



Factsheet

Establishing new flight procedures

“Chips”: Swiss satellite navigation programme

Satellite technology is the future of navigation – including flight navigation. Switzerland intends to take part in these developments in Europe and has therefore launched a corresponding programme called “Chips”. Although simpler applications should soon be available, the development and approval of more complex flight procedures will take some time.

Nowadays, flight navigation, particularly during landing, relies mainly on technologies such as radar or ground-based radio equipment. While these technologies are reliable and have ensured safe flights for decades, they limit the development of new flight procedures. Classical landing procedures, for instance, require aircraft to remain in the extension of the runway centreline for at least the final 10 kilometres of flight in order to pick up the electronic directional beam.

Not missing the flight

Incoming flights guided by satellites positioned in space must also remain in the extension of the runway centreline for the final kilometres in order to stabilise landing. However, since satellite navigation does not require additional installations, new possibilities now open up for cruise flights as well as for takeoff and landing operations. More direct flight paths, landings in topographically challenging areas as well as just outside or further away from settlement areas will become more feasible. Switzerland has aligned itself with Europe in its support for the use of new technologies and the further development of the entire aviation system. The aim is to

optimise safety, capacity and efficiency in aviation while reducing environmental problems such as noise and air pollution.

“Chips” as a source of ideas

The implementation of new technologies for cruise flights and landing/takeoff operations is a major undertaking both in scope and complexity. Corresponding procedures must first be developed, technologically tested and then approved on the basis of criteria that still needs to be established. The implementation of modern forms of navigation requires a full range of technical expertise as well as close cooperation between the various actors (airport operators, air traffic controllers, aircraft and flight system manufacturers, airline companies, aviation authorities).

For this reason, the Federal Office of Civil Aviation (FOCA) decided to work with the Zurich Airport and the air traffic control company Skyguide in 2009 to launch the Swiss-wide coordination and control programme “Chips”, which stands for “**CH**-wide Implementation Program for **SESAR** oriented Objectives, Activities and Technologies”. SESAR is an EU-funded research programme to develop a more effective air traffic control system in Europe. This includes aspects relating to regulation, procedures, systems and engineering. Moreover, “Chips” follows the recommendation made by the International Civil Aviation Organisation (ICAO) that less precise landing operations based on conventional radio beacons be replaced with satellite navigation systems over the medium term (see 2/2 “Chips” – Issue 09-2011).



The Swiss Air Force, the Geneva Airport, two airline companies (Swiss and Easy Jet) and regional airports are also involved in the programme. The “Chips” programme serves as a source of ideas on how to coordinate the introduction of new flight procedures in Switzerland and how to create synergies between individual projects.

First projects implemented

In an initial phase, the Zurich Airport, the Geneva Airport and regional airports submitted over two thousand ideas and project outlines for new landing and takeoff procedures. Many of these projects are currently in the preliminary or starting phase and in some cases require extensive clarifications. Implementation will take several years.

In 2011, FOCA was able to approve the first satellite-based navigation projects after a comprehensive review of documents and analysis: 1) a landing procedure for Northern Runway 14 at the Zurich Airport, which currently uses a conventional navigation system for landing operations; 2) a system enabling Swiss Air Rescue helicopters to land on the Bern University Hospital.

The “Chips” programme is open to other ideas and will steadily develop over the next few years. Even if “Chips” serves as a national coordination platform, it is the actors themselves that are responsible for individual ideas and projects and the airports that are responsible for landing and takeoff procedures.

Once a project is deemed technologically feasible and cost-benefit calculations show that it is economically feasible, a detailed procedure needs to be prepared. That

procedure then needs to be tested – particularly in terms of safety and whether the new procedure can be integrated into the entire aviation system. After this has been done, the process to obtain approval from the authorities needs to be launched, including public disclosure of the proposed changes to operational rules and allowance for possible appeals against these changes. Only after approval has been granted may users (pilots and air traffic controllers) undergo training in the new procedure and operational clearance be given.

The more complex, the more extensive

The more complex a project is, the more extensive the development and approval procedure needs to be. The satellite navigation project to enable Swiss Air Rescue helicopters to land on the Bern University Hospital is an example of comparably simple implementation in an area with low-density air traffic and few participants.

More extensive projects require more resources and considerably more time for development and implementation. This would be the case, for instance, with the somewhat alternative landing procedures planned at the Zurich Airport and Geneva Airport, which will affect not only the airports themselves but also countless pilots and involve hundreds of thousands of landings per year. The development and introduction of new flight procedures will require a preliminary assessment of each situation, which can be very different from one location to another (infrastructure, topography, traffic volumes, etc.).