EGNOS Success Story

Babcock Scandinavian AirAmbulance

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Credits: Babcock

Babcock Scandinavian AirAmbulance has a division in Norway, operating 11 Beechcraft King Air 250 and one (soon to be two) Cessna C680A Latitude. They have their own CAMO Part-145 maintenance organisation and Approved Training Organisation with a Level D Flight Simulator. The fleet is engaged in daily air ambulance missions in Norway, including Svalbard and Jan-Mayen, as civilian air operators under contract by Air Ambulance Services of Norway. Their operational bases are Kirkenes, Alta, Tromso, Bodo, Bronnoysund, Ålesund, and Oslo. As part of their daily operation in Norway's mountainous terrain, 22 airports are classified under risk category B, and 14 airports are classified as critical-class C. The entire fleet is fully LPV capable with two independent FMS/GNSS/SBAS systems.

They started operations in Norway on 1 July 2019 with a completely new aircraft fleet. Most of the approximately 100 pilots came from the previous contractor. The integrated cockpit of their new aircraft fleet was slightly different, and the pilots were new to SBAS operations, including LPV approaches. With that in mind, they slowly started to adopt LPV approaches and soon experienced the transition between conventional and performance-based navigation.

Conventional thinking and transition to PBN

Babcock Scandinavian AirAmbulance's previous training and experience mainly used conventional air navigation (ILS/VOR/NDB). With PBN, a new ballgame emerged. Their experience says that, while it is considerably easier to navigate (using PBN) than conventional navigational aids with all systems operational, solving issues is significantly different when GNSS/SBAS systems are not operating as intended. The C680A was working flawlessly, while the B250s had some issues. It was then that the EGNOS Helpdesk stepped in and provided expert guidance, solving the problems at hand.

Babcock implemented several mitigation measures to address the issues. The first and most important was to adjust flight and theoretical pilot training by focusing on PBN and LPV. Secondly, weekly meetings were held with the manufacturer. The third measure consisted of an informal site (social media) where articles are posted, and people can comment and share experiences as they do in the office.

The work has paid off, and problems are being solved. This is important for Babcock because LPV has been a "game-changer". At Ålesund, on the LPV Cat 1 approach to RWY06, the improved minima has been a significant step in getting the aircraft home, not to mention the increased capability at Molde and Kristiansund. At Harstad, the LPV has better performance than the ILS. The most important step is the increase in possibilities. At some airports with only conventional navaids available, aircraft have to make a demanding circle to land, whereas EGNOS capable aircraft can enjoy a safe straight-in landing with the LPV approach. Mehamn (lat. 71N), the northernmost LPV procedure, is an example of this.

Coping with high latitudes when using GNSS/SBAS

The GNSS antennas are located on top of the aircraft. At higher latitudes, the geostationary EGNOS satellites are lower on the horizon. This implies that when the top of the aircraft is facing north, the GNSS antennas will be in the self-induced aircraft shadow of the EGNOS satellites. Since their aircraft is equipped with dual SBAS receivers, they placed the antennas slightly to the left and right of the roof. Therefore, during the eastbound left bank, they may temporarily lose the right-hand SBAS, and during the westbound right bank, they may temporarily lose the left-hand SBAS. From an operational viewpoint, this is important to know until a more permanent solution is found.

Conclusion

Babcock Scandinavian AirAmbulance has put a great effort into improving LPV operations, and it all starts with knowledge and training. They have committed managers, technicians, and pilots (such as Mads Andre Jarto), and their own Full Flight Simulator approved with SBAS capabilities.