



ADVANCING EVTOL OPERATIONS IN JAPAN - AIRBUS AND HIRATAGAKUEN EVALUATE A MULTI-MISSION USE OF CITYAIRBUS NEXTGEN

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With recent completion of CityAirbus NextGen assembly, Airbus' advanced air mobility teams are focused on putting together the major components that make up the eVTOL prototype, gearing up for its first flight later this year. In addition to reaching this major milestone, the teams continue to work on the development of the entire ecosystem, which will be necessary to operate CityAirbus NextGen. Indeed, beyond the vehicle that will transport passengers in and around urban areas, dedicated infrastructure, public acceptance, regulations of lower airspace and efficient takeoff and landing sites are all essential to the development of viable advanced air mobility services.

In order to provide passengers with the right service and seamlessly integrate it into their daily lives, it is essential to find the right use cases and the right flight routes for eVTOLs. In Japan, Airbus and helicopter operator Hiratagakuen partnered in 2022 to do just that, by evaluating the potential of CityAirbus NextGen for different types of missions in the Kansai region. We take a deep dive into the latest findings of their research and what's next to develop advanced air mobility services in Japan.

Flying in real conditions

The first phase of the partnership started in mid-2022 and successfully ended in March 2023. During this time, Airbus and Hiratagakuen used an H135 helicopter to test advanced navigation and communication technologies for safe operations of eVTOLs in urban environments, while simulating CityAirbus NextGen's flight configuration. The partners' work focused on two use cases: ecotourism and passenger transport. The H135 followed three different flight routes in the Osaka and Kansai regions, to test how CityAirbus NextGen would be able to perform these missions with safe, comfortable, convenient and memorable flight experiences for passengers in busy and complex traffic control areas in and around cities in Japan. The paths linked Kansai International airport to Osaka City, Kobe Airport to Kansai International Airport and Awaji Island to Osaka City. In order to push the representation to the top, the flight conditions of the helicopter were modified to be similar to those of CityAirbus NextGen. "The flights were conducted at a low altitude, of about 500 m. The standard flight altitude for a helicopter would be closer to 600-1000 m. The flight speed was also adapted to CityAirbus NextGen's cruise speed of 100-120 km/h, instead of 200-250 km/h for a helicopter. It really is a comprehensive test of what eVTOLs would be able to achieve and we obtained good and interesting results in this environment," says Mitsuhiro Hirata, Vice President, Head of Aviation Operation Division of Hiratagakuen.



A successful simulation

So what does this tell us? "Most of all, the simulation flights proved that these are flyable routes for an eVTOL, and that satellite signals worked perfectly in these urban environments," explains Mitsuhiro Hirata. This first series of simulation flights was an important milestone on the airspace

management side: it allowed Airbus and Hiratagakuen to start mapping out the required flight corridors to be monitored in lower airspace with advanced air traffic control systems. Additionally, both partners made progress to determine the location of the required ground infrastructure, whether relying on existing helipads or assessing where vertiports would need to be set up in city centres to ensure the optimisation of passengers' journeys. Phase 1 of the partnership marked the first time a helicopter flew this low over the urban zones, with all three flight routes covering densely populated areas. This was an opportunity to rely on the H135's advanced autopilot system to simulate the increased level of autonomous operations in eVTOL flights. "During the flights, the accuracy of the auto-pilot was confirmed by the dedicated equipment installed on the helicopter," says Balkiz Sarihan, Head of Urban Air Mobility, Airbus. The behaviour of the satellite signals was assessed, gathering important insight into how eVTOLs would be able to fly in operational conditions that include urban environments with numerous buildings around.



Phase 2 under way

And there is still a lot to learn. Launched in mid-2023, phase 2 of the partnership is all about testing the potential air medical use of eVTOLs in Japan's cities and mountainous areas. Complementing helicopters' work in these essential missions, CityAirbus NextGen's added value will be measured through simulation flights in two different configurations. On the one hand, to transport blood between the blood supply centres of Osaka and Kobe, covering a distance of 35 km. On the other hand, test flights will simulate the transport of blood from the blood supply centre in Kobe to a hospital in Hyogo Prefecture, covering 40-55 km. The Japan Weather Association will be a key player in this second project, to investigate the best routes to fly over the mountainous area, bringing essential input through high-precision weather data. The winter season will be an important period for the second project. Flight availability is usually reduced during the season due to bad weather and strong winds. As a result, the simulations will also serve to measure how much time can be saved by using different combinations of transport services. "This part of the

simulation will help us understand where exactly an eVTOL could be added into the air medical ecosystem to leverage all aerial and ground assets in an optimal way”, explains Balkiz Sarihan. Stay tuned to learn more.

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