

# Critical Approach

Wide aperture antennas allow access to previously off-limits areas of the airport

**W**atts Antenna Company's super wide-aperture antenna with narrow beams can improve legacy ILS systems allowing aircraft to taxi nearer the runway threshold and hangars.

A pioneering model of Watts' super wide-aperture antenna is in use in Geneva, Switzerland, after achieving Category 3 certification by skyguide in October 2005. This localiser antenna has 68 radiating elements and is 85 metres long.

It employs a wide aperture antenna to create a narrow beam that directs energy only into the airspace an aircraft needs for a safe approach. Traditional design antennas currently in use in ILS systems create a much wider beam, spilling radiation widely over an airport.

Watts still has to certify its wide-aperture antenna systems with the US Federal Aviation Administration (FAA) which won't be easy because the agency is shifting its priorities to GPS from ILS and has even dismantled its ILS testing apparatus.

Watts' chief executive officer John Johnson notes that the new antennas can greatly improve the performance of existing ILS systems in the United States and abroad. Johnson who worked for a decade at Ohio University with Richard McFarland, a leading authority on ILS who at one time worked for the FAA, says that contrary to popular opinion ILS is far from being

a mature technology and that it can be greatly improved with new antennas among other upgrades.

One critical area is where an aircraft cannot taxi or park while another aircraft is on approach to land using the ILS during low visibility. This is because the aircraft on the ground would interfere with the radiation creating the ILS glideslope or localizer beam, an unsafe situation when flying blind. Currently, if the critical area covers part of the apron, an aircraft ready to taxi might even be held at the gate while an ILS approach is underway in low visibility.

ILS critical areas with traditional antennas can keep aircraft as much as 900 feet from the threshold. Unable to move up to the hold short line near the runway, the next aircraft in line for takeoff has to wait for the landing aircraft to touch down before being cleared to taxi that last 900 feet. Johnson says Watts' new antennas will cut the time it takes for the next aircraft in line to depart and increase airport capacity as much as 20 per cent in some cases.

In the United States, controllers currently allow aircraft to taxi into the ILS critical zone during visual flight rule conditions to improve throughput. However, this often disturbs the ILS beam and creates a bumpy ride for the aircraft, passengers and crew during final approach, according to Johnson. With narrow beam antennas the controllers could allow aircraft to taxi into these locations in

both visual and instrument conditions and the beam would not be disturbed so the ride would be smooth.

In addition, areas of the airport where buildings could not be constructed in the past due to possible ILS interference will also be freed up for development. "I'm saying that a simple set of antennas can be the difference in building a hotel, a factory or a large hanger or not building it," Johnson says. "There would be a lot more large buildings at major airports if narrow beam antennas had been available 30 years ago."

Critical area restrictions are calculated based on the largest aircraft operating on the airfield but the new Watts antennas in some cases may allow an aircraft as large as an A380 taxi up to the hold short line near the runway. To determine if this is possible based on the obstacle free zone - designed to keep aircraft on approach clear of obstacles - the regulator would have to conduct a new safety assessment.

But Johnson notes this assessment will be required anyway for GPS approaches and that if an airport equips its ILS with narrow beam antennas it will be a better backup for GPS. He says the last thing an airport wants is to switch from GPS with no critical areas to ILS with lots of them and suddenly find it is conducting fewer departures per hour. So not only will GPS, once it is in use, and ILS be more compatible, but the airport in the meantime will enjoy more capacity. **ATM**

