

INTELLIGENT APPROACH

Optimising runway capacity using dynamic time-based spacing on final approach.



Overview

Intelligent Approach (IA) is an arrival spacing tool that safely optimises runway capacity by dynamically calculating the optimum gap between arriving aircraft for the wind conditions. Think have been working with NATS and Leidos since 2019 to industrialise and implement IA, leading concept development, complex safety assured analysis / adaptation, algorithm development, validation and simulations.

Challenge

To maximise benefits from IA the system needs to be tailored to the specific operational environment (airport, airspace and aircraft); each airport differs in terms of number of runways, runway layout, runway operating modes and other operational specific complexities such as airspace design, traffic mix and air traffic system integration.

Specific Issues

- **Site specific concept refinement**

Capturing customer operating characteristics to ensure the tool is adapted to meet the user requirements which underpin seamless transition into operations.

- **Aircraft performance adaptation**

Obtaining real-world operational data to ensure the IA algorithms are calibrated to ensure the optimum benefits of IA, whilst maintaining required levels of safety.

- **ATC system integration with IA**

Ensuring IA is integrated with all relevant ATC systems to provide IA with the information the tool needs to operate.

Solution

Approach

Think works closely with our industrial partners and operational customers to understand their performance targets within their operations in the light of their existing procedures and capabilities. Think then deliver assured adaptation and system enhancements to ensure that the Intelligent Approach tool matches the ATC operational environment, meets the safety case and assurance criteria, and is validated by the operational community.

Our Impact

As a result of Think's work in collaboration with NATS and Leidos, IA has been deployed successfully at Schiphol, Toronto, Heathrow and Gatwick transitioning smoothly and outperforming expectations. At each of the sites where the tool is operational, the airport has benefited from significant gains in both throughput and the resilience of operations to headwind conditions.