YOUR LONDON AIRPORT Gatwick

Reduced Night Noise Trial
Annex Q – IFP Validation

Gatwick Airport Limited

Prepared by Egis

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Instrument Flight Procedure (IFP) Design

IFP Validation

The Gatwick RNN Trial Approach Procedures were ground validated in September 2023 in accordance with 'ICAO Doc 9906 – Quality Assurance Manual for Flight Procedure Design – Volume 5 – Validation of Instrument Flight Procedures and DAP Policy Statement - Validation of Instrument Flight Procedures (June 2009)'.

The purpose of the ground validation activities was to:

1) Evaluate flyability.
2) Evaluate database coding and accuracy.
3) Verify that waivers/mitigations for deviations from design criteria do not compromise safety.
4) Where permitted by the simulator, evaluate any other factors (such as wind, temperature and barometric pressure) that may be pertinent to the safety of the procedure.

The IFP validation process, including pre-flight validation, simulator evaluation and the production of the validation report, was undertaken by Trax (IFP Design Ltd) who is an Approved Procedure Design Organisation (APDO).

In order to accurately evaluate the flyability and database coding of the procedures, two separate ground validations were conducted; first in an Airbus A320 simulator and second in a Boeing B777 simulator.

Validation Plan

The validation of each procedure began at approximately FL80+ and continued until approaching the Final Approach Fix (FAF). As aircraft do not fly the entire Standard Terminal Arrival (STAR) at night, the validation runs began at an approximate location where aircraft would be given clearance for the approach transition. Once the aircraft was established on the ILS, all runs continued until the aircraft was descending on the glidepath in the Final Approach Segment (FAS). Crew workload was assessed and all procedures were carried out by both Airbus and Boeing aircraft to ensure acceptability.

In total, eight procedures were flown, four to RWY08R and four to 26L, under challenging but realistic meteorological conditions to test flyability, particularly on the Radius-to-Fix (RF) leg.

The following table details the conditions in which the procedures were flown:

Runway	Temperature (°C)	QNH	Weight	Met
08R	30	1049	Maximum landing weight (MLW) for respective aircraft	5000ft wind 300°/57kts, Surface wind 020°/40kts
				5000ft wind 220°/57kts, Surface wind 140°/40kts
				5000ft wind 220°/57kts, Surface wind 160°/40kts
	-5	971		5000ft wind 220°/57kts, Surface wind 140°/40kts
26L	30	1049		5000ft wind 040°/57kts, Surface wind 330°/40kts
				5000ft wind 160°/57kts, Surface wind 210°/40kts
				5000ft wind 130°/57kts, Surface wind 200°/40kts
				5000ft wind 080°/57kts, Surface wind 340°/40kts

Each draft chart showed a graphical layout and textual description of the procedure, waypoint location, waypoint type, speed constraints and altitude constraints. As part of the ground validation, the charts were assessed to determine the accuracy of the content and ensure the crews could interpret the content correctly. In addition, the proposed names of each ICARD waypoint were assessed as to their suitability.

Simulator Database Coding

All 8 procedures were coded into a customised navigation database using ARINC 424 path terminators to define the specific nominal tracks, which were defined by waypoint location, waypoint type, path terminator, speed constraint, altitude constraint and course.

The navigation database for the Airbus and Boeing simulators was supplied by LIDO.

Simulations and Reporting

The Primary Flight and Navigation Displays were filmed to provide detailed validation evidence. In addition to this, photographs of the FMS display were taken during each session for further evidence and a simulator validation report was completed, and signed by the validating pilot.

The Validation

The Airbus A320 validation, supported by easyJet, took place on 20th September 2023. The Boeing B777 validation, supported by British Airways, took place on the 22nd September 2023.

The validation was aimed at testing the overall flyability of the procedures. Each Approach Transition was flown once in conditions that were designed to stress test the procedures.

Lateral track-keeping performance of each Approach Transition was reported to be good, even in challenging meteorological conditions. Drag devices were required to achieve speed restriction, however, it was noted this was due to the aircraft being configured at maximum landing weight, in combination with strong tail winds. The pilots reported the overall workload to be low and manageable. They also assisted in removing any ambiguity from the proposed ATC clearance.