

Proposed changes to London Luton Airport Arrivals

SAIP AD6 Supplement: Standard Terminal Arrival Routes – impact assessment of Instrument Flight Procedure technical amendment



Photo © Graham Custance

© 2021 NATS (En-route) plc ('NERL') and London Luton Airport Operations Ltd ('LLA'), all rights reserved

Issue 1.0

NATS-LLA Public

Roles

| Action | Role | Date |
|----------------------|--|------------|
| Produced | Airspace Change Expert NATS Airspace and Future Operations | 05/11/2021 |
| Reviewed Approved | Airspace and Noise Performance Manager London Luton Airport | 05/11/2021 |
| Reviewed Approved | Airspace Implementation Manager NATS Airspace Development | 05/11/2021 |

Drafting and Publication History

| Issue | Month/Year | Changes this issue |
|-----------|------------|-------------------------|
| Issue 1.0 | 05/11/2021 | Published to CAA Portal |

Contents

1. Introduction – Standard Terminal Arrival Routes from the South and East 3

2. Environmental Impact Assessment of the Technical Amendment..... 4

3. Conclusion and Next Steps..... 4

1. Introduction – Standard Terminal Arrival Routes from the South and East

- 1.1 The SAIP AD6 Airspace Change Proposal (ACP) resulted in the submission of an airspace design called Option 1A, described and published in preceding Stage 4 ACP documentation.
- 1.2 This included seven Standard Terminal Arrival Routes (STARs) from the south and the east, that converge at a new waypoint known as COCCU before ending at the holding waypoint ZAGZO. Those STARs from the south and east were named in the Step 4B ACP document as:

| | | | |
|----------|----------|----------|----------|
| TELTU 2L | RINIS 1L | BEDEK 2L | XAMAN 1L |
| UNDUG 1L | TOSVA 1L | BARM1 1L | |

- 1.3 A standard part of the ACP process is to validate the predicted behaviour of aircraft as they execute the proposed Instrument Flight Procedures (IFPs), including how they leave the STAR and enter the hold. This validation is performed in flight simulators using qualified commercial pilots.
- 1.4 As part of the validation (October 2021) we identified unexpected behaviours when certain combinations of aircraft type, Flight Management System (FMS) manufacturer, and meteorological conditions were tested together. This led to the rare, but possible, issue of Controlled Airspace (CAS) containment not being assured within the CAS volume known as DTY CTA21.
- 1.5 The airspace design team devised a simple technical solution, which was discussed with the CAA and appropriate amendments have been supplied to the IFP Regulator, for study.

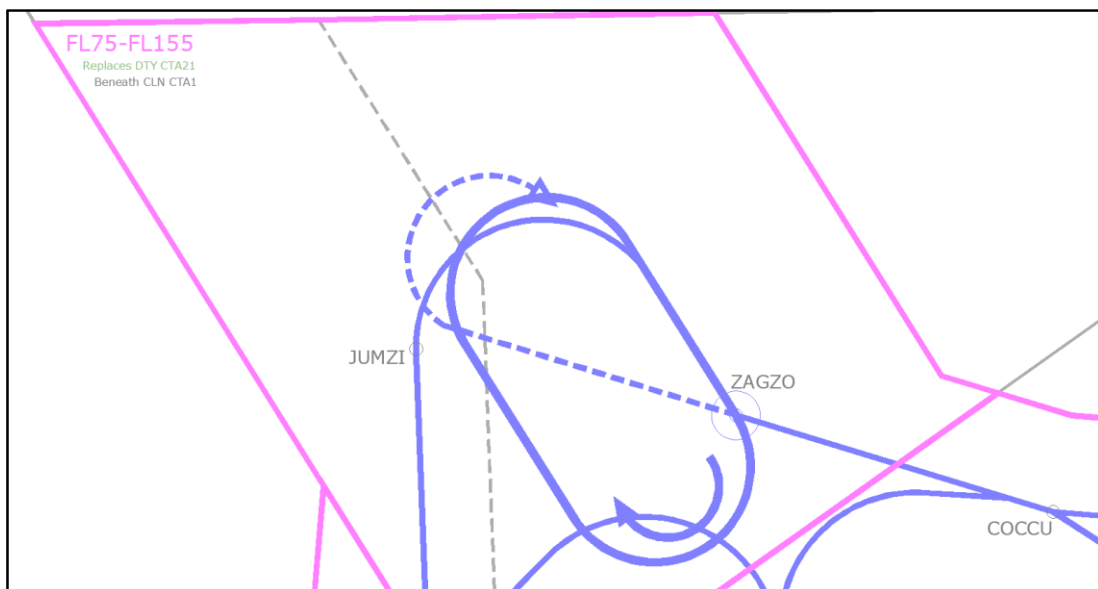
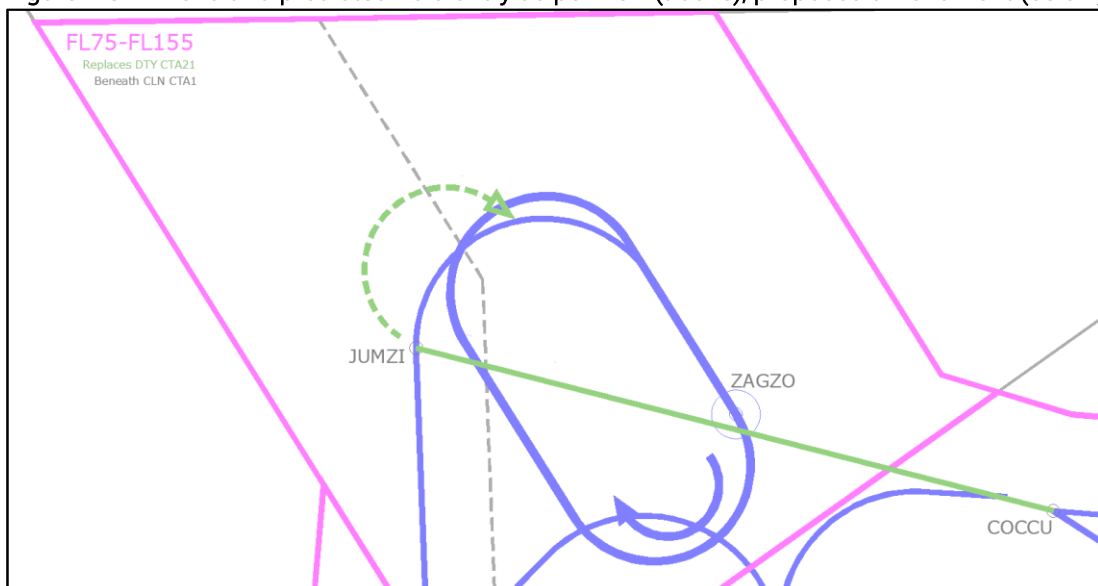


Figure 1 STAR end and predicted hold entry as per ACP (above), proposed amendment (below)



- 1.6 In Figure 1, the aircraft does not behave as predicted (upper diagram) under certain combinations of circumstances for the ACP design via waypoints COCCU-ZAGZO-Enter Hold.
- 1.7 Amending the STAR to route COCCU-JUMZI-ZAGZO-Enter Hold (lower diagram) would correct that unexpected behaviour. This may seem counter-intuitive, but the flight simulations using this amendment behaved as predicted, providing appropriate containment assurance. Technical material known as the Route Separation Analysis Document (which is commercially confidential) has been updated with an addendum, and has been supplied to the CAA privately.
- 1.8 This technical change is known as Design Option 1A-i.

2. Environmental Impact Assessment of the Technical Amendment

Noise: No measurable change in impacts

- 2.1 Should this proposal be implemented with the technical change, aircraft are likely to fly in the same places, at the same flight levels (FL80+), as they would have done should the technical change not have been required.
- 2.2 Hence there would be no measurable change in noise impacts.

Fuel and CO₂: No measurable change in impacts

- 2.3 The CAA was briefed (4th November 2021) by NATS-LLA on the details of the fuel analysis system, its operation, and the methodology used to build the model's internal decision-making parameters.
- 2.4 We explained that expert air traffic controllers and fuel modelling analysts collaborated on this complex task. The CAA was briefed in detail that the models were operated consistently between the designs (do-nothing baseline, the Stage 3 Consultation design (Option 1) and the Stage 4 ACP design (Option 1A), including how the model self-assesses whether to enter the hold.
- 2.5 The CAA was also briefed that the design changes between Option 1 and Option 1A required ATC experts to again collaborate with the fuel modelling analysts to update modelling parameters.
- 2.6 This is because the later design would allow controllers greater decision-making flexibility, and this needed to be translated into the modelling tool as far as was possible, given its limitations.
- 2.7 The model's updates, based on the ACP design Option 1A, led to the reduction in disbenefit described in the ACP and Final Options Appraisal documents published in Stage 4 on the CAA's Airspace Change Portal ([link](#)). The methodology remained consistent with the preceding fuel models.
- 2.8 The CAA understood that there was no need to re-run the fuel analysis model for the technical change to the seven STARs described in Section 1. Discussion on the internal mechanisms and programming of the fuel model (which remain commercially confidential) satisfied the CAA that the model would make the same decisions in the same way as the ACP Option 1A, and the output would not show any difference should the technical change be implemented.
- 2.9 Hence while there may be *de minimis* changes, they would not be a measurable change in fuel and CO₂ impacts.

3. Conclusion and Next Steps

- 3.1 We will amend the seven STARs listed in paragraph 1.2 above accordingly and request that the CAA considers them as part of this ACP.
- 3.2 There would be no measurable environmental impacts as a consequence.
- 3.3 Should the CAA decide to approve this proposal, and its supplements as Design Option 1A-i, implementation is planned for Thursday 24th February 2022.
- 3.4 An updated Technical Map, illustrating the amendments to the STARs, will be uploaded to the CAA's Airspace Change Portal at the same time as this document.

End of document