CAA Operational Assessment

Airspace Change Proposal Title	Heathrow Slightly Steeper Approaches
Airspace Change Proposal Reference	ACP-2017-49
Change Sponsor	Heathrow Airport

Instructions

In providing a response/RAG status for each question, please ensure that one of the following options is used:

YES • NO • PENDING • N/A

Executive Summary

The ACP is for the permanent adoption of 3.2° RNAV slightly steeper approaches (SSA) at Heathrow Airport; with the aim of being a small incremental step to reducing the impact of Heathrow's noise footprint. Two live trials have been conducted (2016 and 2017) to enable the Change Sponsor to investigate the effect of SSA on a number of factors, including safety, the airport's operations and the environment. During the trials, an average of 2% aircraft operated SSA. 3.2° RNAV SSA are currently in operation at Heathrow, permitted by the CAA on a temporary basis whilst this permanent ACP progressed. In 2019 0.6% of aircraft operated SSA; Heathrow suggests that the reduction is because SSA was promoted during the trials to gather evidence. The period of continued use of 3.2° RNAV SSA, pending submission of the ACP, has demonstrated that the proposed option is sound and acceptable.

PART A – Justification for change and options analysis (operational/technical)		
A.1	Is the explanation of the proposed change clear and understood?	**Yes**
	Heathrow are seeking to introduce Slightly Steeper Approaches as part of the airport's ongoing commitment to reducing the aerodrome noise footprint. SSA RNAV procedures will increase the angle of approach for aircraft on final approach from 3.0° to 3.2°.	
A.2	Are the reasons for the change stated and acceptable?	**Yes**

	To introduce Slightly Steeper Approaches as part of an ongoing commitment to reducing the noise footprint in line with Heathrow's Noise Action plan and as outlined in the sustainability strategy 'Heathrow 2.0'.	
A.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	**Yes**
	Overall Heathrow considered the following 5 options: • Do Nothing – the baseline, • Increase the angle of the ILS – this option was not progressed as it would have required the purchasing of additional ILS systems and was therefore deemed unaffordable, • 3.2° RNAV approaches, • 3.5° RNAV approaches, • Steeper than 3.5° RNAV Approaches.	
A.4	Is the justification for the selection of the proposed option sound and acceptable?	**Yes**
	The design principles evaluation conducted at Stage 2 identified that the 'Do Nothing', 3.5° RNAV approaches and Steeper than 3.5° RNAV Approaches did not meet one or more of the Design Principles as outlined below: • Do Nothing – would not deliver the noise benefit, • 3.5° RNAV approaches – reduced availability when the temperature above 15°C and potential for increased go-arounds/runway occupancy times due to potential speed management issues, • Steeper than 3.5° RNAV Approaches – could introduce need for additional spacing and therefore detrimental to throughput. A period of continued use of 3.2° RNAV approaches (under the trial umbrella) pending submission of the ACP has demonstrated that the proposed option is sound and acceptable.	

PART B – Airspace description and operational arrangements		
B.1	Is the type of proposed airspace design clearly stated and understood?	**Yes**
	Heathrow are seeking to permanently adopt 3.2° RNAV SSA whilst maintaining the Instrument Landing System (ILS) at 3.0°.	
B.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	**N/A**

	No changes to hours of operation are proposed.	
B.3	Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?	**N/A**
B.4	Is the supporting statistical evidence relevant and acceptable?	**Yes**
	This SSA ACP does not propose to change the number of aircraft arriving at Heathrow.	
B.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	**Yes**
	RNAV approaches have been identified as having a higher ATC and pilot workload compared to ILS approaches. However, the increased angle of the SSA RNAV approaches does not have an impact on ATC. SSA will remain an elective procedure and the ILS will continue to be used by the majority of aircraft arriving at Heathrow.	
B.6	Are any draft Letters of Agreement and/or Memoranda of Understanding included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?	**N/A**
B.7	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, what action has the change sponsor carried out to resolve any conflicting interests?	**N/A**

B.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	**Yes**
	3.2° RNP Approaches (SSA) were developed by an approved procedure design organisation and approved by the CAA prior to publication in AIP SUP 030/2020. The procedures are designed to meet ICAO PANS OPS Document 8168, CAP 785 and UK AIP GEN 1.7 requirements.	
B.9	Is the proposed airspace classification stated and justification for that classification acceptable?	**Yes**
	This Airspace Change Proposal does not seek to change Heathrow's existing airspace structure and/or routes. SSA are also contained within Heathrow's existing CAS structures.	
B.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	**N/A**
	This SSA ACP does not change the number of aircraft arriving at Heathrow, how Heathrow's airspace is used, or which airlines are able to operate to/from Heathrow.	
B.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	**N/A**
B.12	Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?	**N/A**

	This ACP does not propose to make any changes to CAS or any existing access arrangements.	
B.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	**N/A**
	This ACP does not propose to make any changes to CAS or any existing access arrangements.	
B.14	Are any airspace user group's requirements not met?	**No**
	SSA will continue to be an elective procedure with the majority of aircraft arriving using the published Instrument Landing System (ILS) approaches.	
B.15	Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).	**N/A**
B.16	Is the airspace design of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?	**Yes**
	This Airspace Change Proposal does not seek to change Heathrow's existing airspace structure and/or routes. SSA are also contained within Heathrow's existing CAS structures.	
B.17	Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter.)	**N/A**

B.18	Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?	**Yes**
	This Airspace Change Proposal does not seek to change Heathrow's existing airspace structure and/or routes. SSA are also contained within Heathrow's existing CAS structures.	
B.19	Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?	**Yes**
	This Airspace Change Proposal does not seek to change Heathrow's existing airspace structure and/or routes.	
B.20	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?	**N/A**
B.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	**N/A**
	No changes to existing structures.	

PART C – Supporting resources and communications, navigation and surveillance infrastructure		
C.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	
	Communication: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure?	**N/A**

	Using existing and established communications.	
	Navigation: Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV-derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol standards? For example, for navaids, has coverage assessment been made, such as a DEMETER report, and if so, is it satisfactory?	**Yes**
	No change to the existing ATS route structures.	
	Surveillance: Radar provision – have radar diagrams been provided, and do they show that the ATS route/airspace structure can be supported?	**Yes**
	As per existing Radar provision.	
C.2	Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growth acceptable?	**N/A**

PART D – Maps/charts/diagrams		
D.1	Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates? (We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with aeronautical cartographical standards (see airspace change guidance), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals.)	**Yes**

	Procedure charts are included.	
D.2	Do the charts clearly indicate the proposed airspace change?	**Yes**
D.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft amendment?	**Yes**
D.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	**N/A**

PART E – Operational impact		
E.1	Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory? Consideration should be given to:	
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	**Yes**

	Nil.	
	b) Impact on VFR Routes.	**N/A**
	This ACP does not propose to make any changes to the existing CAS or Heathrow's VRPs.	
	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	**Yes**
	No change to lateral tracks over the ground. SIDs, STARs and holds remain as existing.	
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	**N/A**
	e) Any flight planning restrictions and/ or route requirements.	**N/A**
E.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	**Yes**
	The ACP consultation material clearly reflects the following: • No change to airspace as part of this ACP. • No change to physical infrastructure on the ground. • RNAV approaches have been identified as having a higher ATC and pilot workload compared to ILS approaches. However, the increased angle of the SSA RNAV approaches does not have an impact on ATC. • SSA will remain an elective procedure and the ILS will continue to be used by the majority of aircraft arriving at	

	Heathrow. • 3.2° approaches reduce the average Sound Exposure Level (SEL) of aircraft on an RNAV approach by up to 0.74 dBA (the average at all noise monitoring terminals across the trials was 0.51 dBA) compared with the Baseline.

PART F – Stage 5 Recommendations/Conditions/PIR Data Requirements		
F.1	Are there any Recommendations which the change sponsor **should try** to address either before or after implementation (if approved)? If yes, please list them below.	**No**
	GUIDANCE NOTE: *Recommendations are something that the change sponsor **should try** to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.*	
F.2	Are there any Condition(s) which the change sponsor **must fulfil** either before or after implementation (if approved)? If yes, please list them below.	**No**
	GUIDANCE NOTE: *Conditions are something that the change sponsor **must fulfil** either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors **must** observe any condition(s) contained within the regulatory decision; failure to do so **will usually** result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.*	
F.3	Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.	**Yes**
	GUIDANCE NOTE: *PIR data requirements concerns any specific data which the change sponsor must collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.* • Record the number of RNAV 3.2° approaches flown. This should be captured in a format to enable any trends to be identified. • Record details of any go-arounds resulting from RNAV 3.2° approaches. • Record details of any safety related issues associated with RNAV 3.2° approaches.	

F.4	Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?	**Yes**

PART G – Operational Assessment Summary and Recommendation

SSA RNAV approaches have been conducted during 2 comprehensive trials spanning different environmental weather condition periods and over an extended period of continued use pending completion of the ACP. It is accepted that RNAV approaches do increase the workload for both the pilot and the controller and they are accordingly deemed elective procedures, the default instrument approach being ILS.

However, the trial and extended period of use has proven that Heathrow can integrate a number of RNAV approaches within their arrivals footprint without compromising safety or reducing capacity, albeit that this number is not finite. The trial identified that pilot and controller workload were not impacted by increasing the angle of the RNAV approach from 3.0° to 3.2°, thereby enabling environmental benefits to be considered against a common operational baseline.

Although the ACP delivers only a small noise reduction benefit the outcome is in line with that stated in the Statement of Need which was to contribute as part of the airport's ongoing commitment to reducing the aerodrome noise footprint and it is recommended that it be approved.

Airspace Regulator (Principal)	[redacted]	[redacted]	20/07/21

PART H – Final Regulatory Decision – Comment and Approval

Manager Airspace Regulation comments: The sponsor has conducted two trials which have enabled them to gain data across differing weather conditions by way of assessing the proposal. Whilst the proposal provides for only a small reduction in noise, this is in line with the airport's aim for an overall reduction in noise footprint. I am satisfied, for the reasons presented, to recommend this ACP for approval.

Manager Airspace Regulation	[redacted]	[redacted]	29/07/21

Head AAA comments and Decision: This ACP is approved. Head AAA endorses the recommendations set out in this document and adopts the recommended decision and recommended reasons set out above as the CAA's decision in respect of this airspace change and the reasons for it. Head AAA endorses the ACP decision.			
Head AAA	[redacted]	[redacted]	30/07/21