Title of Airspace Change Proposal	**Newcastle STAR and PRNAV (GNSS) Approaches**
Change Sponsor	**Newcastle International Airport Ltd (NIAL)**
SARG Project Leader	[redacted]
Case Study commencement date	**16 November 2017**
Case Study report as at	**14 February 2019**
File Reference	**ACP-2014-02**

Instructions

In providing a response for each question, please ensure that the 'Status' column is completed using the following options:

- **Yes**
- **No**
- **Partially**
- **N/A**

To aid the SARG Project Leader's efficient Project Management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved Green **not resolved** Amber **not compliant** Red as part of the AR Project Leader's efficient project management.

1.	Justification for change and "Option Analysis"	Status
1.1	**Is the explanation of the proposed change clear and understood?**	YES
	The change is well understood. In summary it is to provide a Standard Terminal Arrival Route (STAR) in controlled airspace for aircraft arriving to either runway at Newcastle International Airport from the south. The STAR leads to a transition route for both runways and a precision area navigation (PRNAV) Global Navigation Satellite System (GNSS) approach. The routes duplicate current operations.	
1.2	**Are the reasons for the change stated and acceptable?**	YES
	The reasons for the change are clearly stated in the ACP and are acceptable. The change is required to provide more efficient flight, potential CO2 and fuel savings (in line with the CAA strategic objectives) and utilise modern Performance Based Navigation (PBN) technology allowing the older approach equipment to be phased out and allow compliance with EU and UK policies on PBN.	
1.3	**Have all appropriate alternative options been considered, including the 'do nothing' option?**	YES
	Yes, four options including the 'do nothing' option were considered.	
1.4	**Is the justification for the selection of the proposed option sound and acceptable?**	YES
	The chosen option is sound and acceptable. Rather than use 2 STARs, one for each runway, in order to conform to the Traffic Orientation Scheme around P18, create separation from aircraft using Runway 07 SID, and to continue to comply with an airspace usage agreement with a gliding site SW of the airport, a single STAR was selected as the best solution.	

2.	Airspace Description and Operational Arrangements	Status
2.1	**Is the type of proposed airspace clearly stated and understood?**	YES
	There is no change proposed to the existing airspace infrastructure.	
2.2	**Are the hours of operation of the airspace and any seasonal variations stated and acceptable?**	N/A
	N/A	
2.3	**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**	YES

	of High Seas airspace changes?	
	Newcastle inbound and outbound aircraft routing via P18 must conform to a Traffic Orientation Scheme, and this is maintained by the proposal. NATS have confirmed the design conforms with current standing agreements for the adjacent airspace. There are no interactions with international airspace.	
2.4	**Is the supporting statistical evidence relevant and acceptable?**	**YES**
	Yes. Current and forecast growth supports the proposal.	
2.5	**Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?**	**YES**
	There is no impact on traffic mix or complexity as the proposal replicates current ATC procedures, formalising the current 'recommended routes'.	
2.6	**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?**	**YES**
	Yes. LoAs are provided with Durham Tees Valley Airport (DTVA) and Northumbria Gliding Club. Both of these detail how the proposal resolves potential ATS issues and maintains the 'status quo' by not impinging on these operations.	
2.7	**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 sponsor carried out to resolve any conflicting interests?**	**N/A**
2.8	**Is the evidence that the Airspace Design is compliant with ICAO SARPs, Airspace Design & FUA regulations, and Eurocontrol Guidance satisfactory?**	**YES**
	Yes. The STAR and PRNAV approaches comply with airspace and infrastructure requirements, and Eurocontrol and ICAO guidance and regulations. FUA has been applied in the chosen option.	
2.9	**Is the proposed airspace classification stated and justification for that classification acceptable?**	**N/A**
	There is no change to airspace classifications in the proposal.	
2.10	**Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?**	**YES**

	Yes. There is no change of airspace classification in the proposal.	
2.11	**Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation)**	**YES**
	The STAR is wholly contained within an airway (P18). The PRNAV approaches replicate current ATC vectoring. The proposal maintains separation agreements with DTVA and Northumbria Gliding Club. The Hold has a base level of FL090 and approximately 80% of the protection area is contained within P18; however, the nominal is well contained within P18, with only part of the protection area extending beyond the edge of P18 into Class G airspace.	
2.12	**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?**	**YES**
	Yes. There is no change to current ATC procedures.	
2.13	**Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?**	**YES**
	Yes. There is no change to current ATC procedures.	
2.14	**Are any airspace user group's requirements not met?**	**NO**
	No.	
2.15	**Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).**	**N/A**
2.16	**Is the airspace structure 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?**	**Partially**

	The proposed STAR is embedded within P18 airway which is of sufficient dimensions. An RNAV Hold at ETSES (end of the STAR) was added to the design for safety late on in the process. Several locations were examined before the final solution. The nominal is entirely contained within P18, and approximately 80% of the protection area is also contained within P18. The base level of the Hold is FL090. During the assessment the sponsor provided assurance on their operations/mitigation in the event of a non-R/T aircraft in the RNAV Hold during extreme cross-wind weather drifting out of P18 into Class G airspace. This mitigation included their role as a LARS unit, being a military co-opted airfield, operating in a low-traffic density area, historically having very few airspace infringements, and not allowing RNAV procedures without a serviceable radar. This mitigation was accepted by the CAA.	
2.17	**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**
2.18	**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**
	Yes. There is no change to current ATC procedures and no new airspace structures with the proposal.	
2.19	**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**
	Yes. There is no change to current airspace structures and the approaches are PANS Ops compliant.	
2.20	**If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?**	**YES**
	Yes. The proposal takes into account operations at DTVA and is captured in an LoA.	
2.21	**Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?**	**YES**
	Yes. The proposal takes into account the Traffic Orientation Scheme in the area and effectively transitions from en-route to terminal approach, conforming to current standing agreements.	

3.	**Supporting Resources and CNS Infrastructure**	**Status**

3.1	**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?	**YES**
	No change to existing communication infrastructure is necessary as part of the proposed solution.	
	▪ **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? E.G. Navaids – has coverage assessment been made eg. a DEMETER report, and if so, is it satisfactory?	**YES**
	No change to navigational infrastructure is required for the introduction of GNSS approaches for suitably equipped aircraft. In addition the STAR and PRNAV approaches are wholly contained within controlled airspace and monitored by ATC.	
	▪ **Surveillance:** Radar Provision – have radar diagrams been provided, and do they show that the ATS route / airspace structure can be supported?	**YES**
	Diagrams have been provided demonstrating the approaches are contained within current surveillance cover and there are no anticipated new demands placed upon the existing infrastructure.	
3.2	**Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growths acceptable?**	**N/A**

4.	Maps/Charts/Diagrams	Status
4.1	**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 AC&D aeronautical cartographical standards (see CAP725), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals. AC&D work would relate to regulatory consultation charts only).**	YES
	Charts of the current airspace and proposed approaches are provided in Chapter 1 of the ACP and Appendix J; however, no new airspace construct is required in the proposal. Diagrams are also provided detailing tracks over the ground. WGS84 data supporting the application has been received and checked.	
4.2	**Do the charts clearly indicate the proposed airspace change?**	YES
	Yes. The charts and data points clearly show the proposed STAR and GNSS approaches.	
4.3	**Has the Change Sponsor identified AIP pages affected by the Change Proposal and provided a draft amendment?**	YES
	Yes.	

5.	Operational Impact	Status
5.1	**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 GAT, on OAT or on VFR general aviation traffic flow in or through the area.**	YES
	Yes. The proposed design was changed post consultation, pre-submission, following an objection. This change ensures IFR GAT operations out of DTVA are not impacted.	
	b) Impact on VFR Routes.	N/A
	c) Consequential effects on procedures and capacity, ie on SIDS, STARS, holds. Details of existing or planned routes and holds.	YES
	The consequential effects have been discussed. Initially no RNAV Hold was incorporated into the design or consulted on, the intention was to utilise the currently published conventional Hold if required. However, after deliberation and looking at safety and practicality issues with the proposed design an RNAV Hold at ETSES, the end of the STAR, was proposed by the sponsor. This addendum went to key aviation stakeholders for supplementary engagement gaining approval from all. The STAR procedure is enhanced by the addition of a Hold having safety benefits and positive consequential effects on procedures.	
	d) Impact on Airfields and other specific activities within or adjacent to the proposed airspace.	YES
	Yes. The pre-consultation key stakeholder engagement produced a design change on the GNSS approaches to ensure operations at Northumbria Gliding Club are not impacted.	
	e) Any flight planning restrictions and/ or route requirements.	N/A
5.2	**Does the Change Sponsor Consultation letter reflect the likely operational impact of the change?**	YES
	Yes. The language used and the technical explanation is tailored to ensure non-aviation audiences would understand the concept and issues.	

6.	Economic Impact	Status
6.1	**Is a provisional economic impact assessment to all categories of operations and users likely to be affected by the change included and acceptable? (This may include any forecast capacity gains and the cost of any resultant additional track mileage).**	YES
	The proposal is not assessed to have a significant economic impact, although there are some proposed economic benefits to airline operators and potential environmental benefits. The routes replicate current practice, no additional traffic is generated from the proposal and there is no new airspace construct. It is anticipated that there will be no traffic displacement as a result of this proposal. There are economic benefits to airlines operating in/out of the airport from utilising a published GNSS approach and continuous descents operations. In addition to reduced fuel burn, lower power settings on the engines for continuous descent operations could reduce engine wear and have knock on financial benefits.	

Case Study Conclusions – To be completed by SARG Project Leader	Yes/No
Has the Change Sponsor met the SARG Airspace Change Proposal requirements and Airspace Regulatory requirements above?	**YES**
The change sponsor has fully met the SARG ACP and AR requirements.	

Outstanding Issues		
Serial	**Issue**	**Action Required**
1		
2		

Additional Compliance Requirements (to be satisfied by Change Sponsor)	
Serial	**Requirement**
1	NIAL should record any/all noise complaints or airspace conflicts so these can be considered against the proposal in the PIR.
2	

Recommendations	Yes/No
Is the approval of the SoS for Transport required in respect of the Environmental Impact of the airspace change?	**NO**
Is the approval of the MoD required in respect of National Security issues surrounding the airspace change?	**NO**

General Summary

The proposal looks to introduce a STAR and PRNAV (GNSS) approaches to runways 07 and 25 at Newcastle International Airport. The STAR is wholly contained in existing controlled airspace, (Airway P18,) and the GNSS approaches nigh on replicate current routes used by Newcastle Air Traffic Control to vector approaches to the airport. No new airspace constructs are required, and the proposal conforms to the P18 Traffic Orientation Scheme. The proposed design was refined after key stakeholder engagement, prior to consultation, and takes into account gliding operations at Northumbria Gliding Club. Post consultation the commencement level for the STAR was adjusted from FL130 to FL140 to ensure nil impact on GAT departing DTVA, and continues to conform to current LoAs. This minimises the impact on all other airspace users and maximising route replication reduces the new tracks over the ground. The consultation had 92 responses from a good mix of main based airlines, other airspace users, Parish Council/Local Authority group responses and individual residents. Of these, 88 were in support with no objection. Of the 4 objections, one was withdrawn after clarification was sought, and a second formed the basis for modifying the STAR level. Post consultation the sponsor sought to include an RNAV Hold which had originally been missed in the submitted design. Owing to the location of this at the end of the STAR, the nominal being fully contained and the protection area 80% contained within P18, and with a base level of FL090 the CAA deemed it appropriate for the sponsor to conduct supplementary engagement with key aviation stakeholders regarding this. Positive feedback was received and the RNAV Hold added to the design. Only to be utilised in an emergency, and not for training purposes, this will enhance safety for the proposal. The proposal is the minimum size to meet the safety and operational requirements whilst having minimal impact on others. Economic benefits would appear to be realised for airline operators whilst crucially not creating any negative economic consequences and having minimal environmental impacts.

Comments & Observations

The proposed STAR and PRNAV (GNSS) approaches at Newcastle International Airport balance the requirements of the airport and operators along with those of other airspace users and adjacent airports. By utilising modern technology the sponsor is looking to ensure more accurate predictable flight paths which duplicate current operations yet allow for flight planning benefits of reduced fuel uptake, and reduced emissions from continuous descent operations. The sponsor provided a diagram of descent profiles for conventional and RNAV arrivals to Runway 07 in their Consultation Document, and provided an equivalent diagram showing similar benefits for Runway 25 during the assessment phase. The proposal adheres to current LoAs and does not require any new airspace constructs which are significant benefits from an ‘other airspace users’ perspective. GNSS approaches will create predictable concentrated traffic patterns and reduce noise scattering; however, this concentration may cause an uplift in noise complaints from the minority more regularly over-flown, (although only 2 respondents to the Consultation Document raised this as a potential issue,) and NIAL should monitor and record all these instances for consideration in the PIR. The proposed STAR is in line with UK and EU policies on

airspace modernisation strategies, performance-based navigation, and modernising the UK airspace system. The proposal is in line with CAA objectives for managing aviation noise and DfT guidance on promoting procedures incorporating continuous descent operations and low power/low drag approaches. It is the recommendation of the Case Officer that the Newcastle STAR and PRNAV(GNSS) ACP is approved.

Operational Assessment Sign-off/ Approvals	Name	Signature	Date
Operational Assessment completed by: (AR Case Officer)	[redacted]	[redacted]	04 February 2019
Operational Assessment approved: (Manager Airspace Regulation)	[redacted]	[redacted]	14/02/2019
Manager AR Comments: I recommend approval of this airspace change proposal. Newcastle have carried out an appropriate level of engagement considering both the positive and negative the impacts of arriving aircraft once they are below 7,000ft (...there will be concentration, but aircraft will be using CDO and the evidence provided shows they are higher at every point on the arrival(s)). Additionally, Newcastle's late, but sensible, inclusion of a hold on the arrival procedure brings it into line with normal UK practice. I accept the airport's rationale for how an RFT arrival would be manged with this hold.			

Head AAA Comment/ Approvals	Name	Signature	Date
Operational Assessment Conclusions approved by: (Head AAA)	[redacted]	[redacted]	19/02/2019
Head AAA Comments: I have nothing further to add to the comments of the case officer and Manager Airspace regulation. I recommend approval of this Airspace Change.			

Group Director SARG Decision/ Approval	Name	Signature	Date
Group Director SARG Decision: APPROVED	[redacted]	[redacted]	20 Feb 2019
Group Director SARG Comments: Concur with all comments			