



Carlisle Lake District Airport ACP

Proposal for Revised Instrument Flight Procedures

Document Details

Reference	Description
Document Title	Carlisle Lake District Airport ACP
	Proposal for Revised Instrument Flight Procedures
Document Ref	71046 20
Issue	Issue 1.1
Date	26 th March 2019
Client Name	Carlisle Lake District Airport
Classification	

Issue	Amendment	Date
Issue 1	Initial Issue	26 th March 2019
Issue 1.1	Updated Draft Plate for RW 06	12 th April 2019

Approval Level	Authority	Name
Author	Osprey CSL	██████████
Reviewer	Osprey CSL	██████████

Executive Summary

Carlisle Lake District Airport (CLDA) has developed into a thriving General Aviation Airport and is home to two fixed wing flying training schools, one microlight school and a gyroplane flying school. In 2009, the Airport was bought by Stobart Aviation. They recognised the strategic position of the Airport and in 2014 work started on a £12M Air Freight Distribution Centre, which is now leased to Eddie Stobart Logistics. The Airport has recently undertaken a major infrastructure upgrade programme to resurface the runway, improve the Aerodrome Ground Lighting (AGL) to ensure that the Airport meets the latest CAA regulations and has announced the launch of regular scheduled passenger services between London Southend Airport, Belfast and Dublin commencing 4th July 2019.

The Issue

As well as physical infrastructure upgrades, the Airport requires more redundancy in its Instrument Flight Rules (IFR) approach procedures; this will allow aircraft to make more successful approaches during poor weather conditions. Current IFR approaches are provided by a collocated Non-Directional Beacon (NDB) and Distance measuring Equipment (DME) procedure. The NDB and DME will continue to be maintained, but they utilise old technology and obtaining spares for upgrades and maintenance in the future may be problematic. Carlisle Lake District Airport is proposing to introduce RNAV procedures and Point in Space (PinS) approaches which utilises Global Navigation Satellite Systems (GNSS) for aircraft and helicopters arriving at the airport.

Justification

The move to RNAV technology allows a more direct path and allows aircraft to fly Instrument Approach Procedures (IAPs) into an airport that does not have a ground-based navigation beacon and is in accordance with national and international initiatives to improve the navigational performance of aircraft.

The proposed new additional approaches will give more choice to pilots operating at Carlisle Lake District Airport. They can continue to utilise the conventional NDB/DME approach or they could choose the new RNAV procedures that will not only provide lateral guidance but will also provide the pilot with vertical guidance information. The Airport also requires more redundancy in its approach procedures as existing equipment becomes old and unreliable; this will allow aircraft to make more successful approaches during poor weather conditions.

The key drivers for introducing the new procedures are as follows:

- Improvement to existing facilities to support IFR operations;
- To provide resilience to the existing IFR navigational facilities; and
- To comply with the UK's commitment to ensure all airports have Performance Based Navigation (PBN) in service by 2024.

Consultation Response

The proposed changes to the IFPs were published in the Carlisle Airport Consultation Document which was made available on the Carlisle Lake District Airport website and distributed to stakeholder organisations for comment. The consultation period ran from 4th January 2018 to 29th March 2018. The purpose of the consultation was to gather and analyse the views of stakeholders concerning the proposal to introduce RNAV (GNSS) procedures at Carlisle Lake District Airport. The Airport hosted drop-in sessions, giving the opportunity for interested parties to speak to members of the project team about the proposal.

The Carlisle Airport Consultation Document was circulated via post, email or online form to a total of 70 stakeholder consultee organisations, including 32 NATMAC organisations. A total of 9 responses were received from these direct consultees and in addition, a further 30 submissions were received from other individuals or organisations.

The Consultation produced some moderate opposition from the GA community supported by the BGA and local gliding clubs. The main emphasis of the concerns are as follows:

- The proposed location of the Runway 06 Hold is an area popular with the gliding community and would restrict the ability of gliders to operate there and increase their risk of mid-air collision;
- The proposed location of the Runway 06 Hold is prone to severe weather conditions that would adversely affect aircraft operating there;
- The proposed location of the Runway 06 Hold is directly overhead an area of outstanding natural beauty, and the noise of commercial aircraft would negatively impact tourism to the area.

Additionally, the Consultation received an objection from Newcastle International Airport based on the potential risk of conflict for aircraft under their control routing to and from the west and aircraft operating in the Runway 24 Hold.

Proposed Solution

Following a thorough review of the objections received and the potential options, Carlisle Lake District Airport has decided to remove the proposed Runway 06 Hold to the south west of the airport, retaining instead the Hold in the airport overhead and introducing a hold for the Runway 24 procedure. Carlisle Lake District Airport is proposing to introduce RNAV (GNSS) procedures for aircraft landing on Runways 06 and 24 and Point in Space (PinS) approaches for helicopters arriving for Runways 01 and 19.

The purpose of this document is to provide information regarding the proposal to establish RNAV(GNSS) approach procedures, in accordance with CAA document CAP 725 [Reference 1], for aircraft arriving at Carlisle Lake District Airport.

If the CAA approves this application for the implementation of new RNAV Procedures, implementation is expected to be as part of AIRAC 13/2019 (5th December 2019), or AIRAC 01/2020 (2nd January 2020).

Table of Contents

1	Introduction.....	1
1.1	General.....	1
1.2	Stobart Aviation	1
1.3	Global Navigation Satellite System (GNSS).....	1
2	Justification for Change and Analysis of Change Options	2
2.1	Current Airspace Arrangements and Operations	2
2.2	Proposed Change to Airspace Arrangements.....	4
2.3	Justification for Revised Instrument Flight Procedures (IFP).....	5
2.4	Defining the Options	5
2.5	Option 1 – Implement RNAV Procedures.....	5
2.6	Option 2 – Do Nothing	6
2.7	Justification for the Proposed Option	6
3	Preferred Option Airspace – Description at Consultation	7
3.1	Airspace Design	7
3.2	Runway 24	7
3.3	Runway 06	7
3.4	Aircraft Holds.....	8
3.5	Point in Space (PinS) Approaches.....	8
3.6	Proposed Implementation Date	9
4	Consultation Analysis Summary	11
4.1	Overview	11
4.2	Consultation Summary	11
4.3	Aviation Stakeholder Consultee Organisations	11
4.4	Consultation Responses.....	12
4.5	Meetings with Local Stakeholders.....	12
4.6	Key Issues.....	13
4.7	Consultation Conclusions Summary	14
5	Proposed Airspace Description.....	15
5.1	Post-Consultation Airspace Development.....	15
5.2	Proposed Instrument Flight Procedures.....	15
5.3	Proposed Point in Space (PinS) Approaches.....	18
5.4	Hours of Operation	20
5.5	Interaction with Existing En-Route Structures and ANSPs.....	20
5.6	Current and Forecast Traffic Data.....	20
5.7	Draft Letters of Agreement and Memorandum of Understanding	21
5.8	Airspace Design Compliance with ICAO Standards and UK Policy.....	21
5.9	Plans and Procedures for Equitable Access	22
6	Supporting Infrastructure and Resources	23

6.1	Surveillance Infrastructure	23
6.2	Communications Infrastructure	23
6.3	Staffing Availability and Qualifications.....	23
7	Operational Impact	24
7.1	Impact on other ANSPs	24
7.2	Impact on Commercial Air Transport	24
7.3	Impact on General Aviation Users	24
7.4	Impact on Military Users	25
7.5	Impact on Existing Procedures and Capacity.....	25
8	Economic and Environmental Impact	27
8.1	Introduction.....	27
8.2	Traffic Forecasts.....	27
8.3	Impact of Noise.....	28
8.4	Tranquillity and Visual Intrusion	29
8.5	Anticipated level of fuel burn/CO ₂ Emissions	30
8.6	Anticipated Effect on Local Air Quality	30
9	Safety Management	31
9.1	Purpose	31
9.2	Safety Case Parts 1 and 2	31
9.3	Safety Case Parts 3 and 4	32
9.4	Safety Summary	32
10	Airspace and Infrastructure Requirements.....	33
10.1	Introduction.....	33
10.2	Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation	33
11	IAIP Amendment.....	37
11.1	AD 2-EGNC-1 Carlisle Airport – Textual Data.....	37
11.2	AD 2-EGNC-8 Charts Related to the Airport	37
12	References	38
A1	Glossary	1-1

Table of Figures

Figure 1	– Carlisle Lake District Airport and the Current Surrounding Airspace Structure	2
Figure 2	– Existing Runway 24 NDB/DME Instrument Approach at CLDA (Direct Approach)	3
Figure 3	– Existing Runway 06 NDB/DME Instrument Approach at CLDA (Direct Approach)	4
Figure 4	– Proposed Runway 24 RNAV Arrival Procedure at CLDA.....	7
Figure 5	– Proposed Runway 06 RNAV Arrival Procedure at CLDA.....	8
Figure 6	– Proposed PinS Approaches – Runway 19 and Runway 01	10
Figure 7	– Proposed CLDA RNAV(GNSS) Approach Runway 24	16

Figure 8 – Proposed CLDA RNAV(GNSS) Approach Runway 06	17
Figure 9 – Proposed CLDA RNAV(GNSS) PinS Approach Runway 19	18
Figure 10 – Proposed CLDA RNAV(GNSS) PinS Approach Runway 01	19

Table of Tables

Table 1 – Additional Consultation Meetings	12
Table 2 – Nature of Objections Raised by Consultees	13
Table 3 – Carlisle Lake District Airport ATC Planned Operating Hours	20
Table 4 – CLDA Aircraft Movement Data	20
Table 5 – Carlisle Lake District Airport Annual Aircraft Movement Data	28
Table 6 – Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation	36
Table 7 – Table of References	38

Table of Enclosures

Enclosure 1 – Carlisle Airport/RAF Spadeadam Current Memorandum of Understanding
Enclosure 2 – Carlisle Lake District Airport ACP Consultation Feedback Report
Enclosure 3 – Carlisle Lake District Airport ACP Consultation Document

1 Introduction

1.1 General

The site that Carlisle Lake District Airport now occupies first commenced aviation operations at the outbreak of the Second World War when the Royal Air Force developed a new air strip at Crosby-on-Eden. Since then Carlisle Lake District Airport has developed into a thriving General Aviation Airport.

The Airport lies just 6 miles to the east of Carlisle and approximately 20 miles north east of the Lake District National Park. The Airport is home to two fixed wing flying training schools, one microlight school and a gyroplane flying school.

1.2 Stobart Aviation

In 2009, Carlisle Lake District Airport was bought by Stobart Aviation. They recognised the strategic position of the Airport and in 2014 work started on a £12M Air Freight Distribution Centre, which is now leased to Eddie Stobart Logistics. In June 2017, the Cumbria Local Enterprise Partnership (LEP) invested £4.75M in order to develop the county's connectivity. This enabled work to commence on building a new passenger terminal and other infrastructure improvements. The Airport has recently announced the introduction of regular passenger services between London Southend Airport, Belfast and Dublin commencing in July 2019. The Airport has already undertaken a major infrastructure upgrade programme to resurface the runway and improve the Aerodrome Ground Lighting (AGL) to ensure that the Airport meets the latest CAA regulations.

These investments have been designed to improve the facilities to existing users of the Airport, but the introduction of regular passenger services will provide a boost to the county's transport infrastructure benefitting many local people and services. As well as physical infrastructure upgrades, the Airport requires more redundancy in its current instrument approach procedures; this will allow aircraft to make more successful approaches during poor weather conditions.

1.3 Global Navigation Satellite System (GNSS)

Traditionally, aircraft navigate a route by flying to, or away from a sequence of ground-based navigation beacons. RNAV (derived from aRea NAVigation) allows an aircraft to navigate using Global Navigation Satellite Systems (GNSS) instead of the ground-based beacons. RNAV allows a more direct path and allows aircraft to fly Instrument Approach Procedures (IAPs) into an airport that does not have a ground-based navigation beacon. The move to RNAV technology is in accordance with national and international initiatives to improve the navigational performance of aircraft.

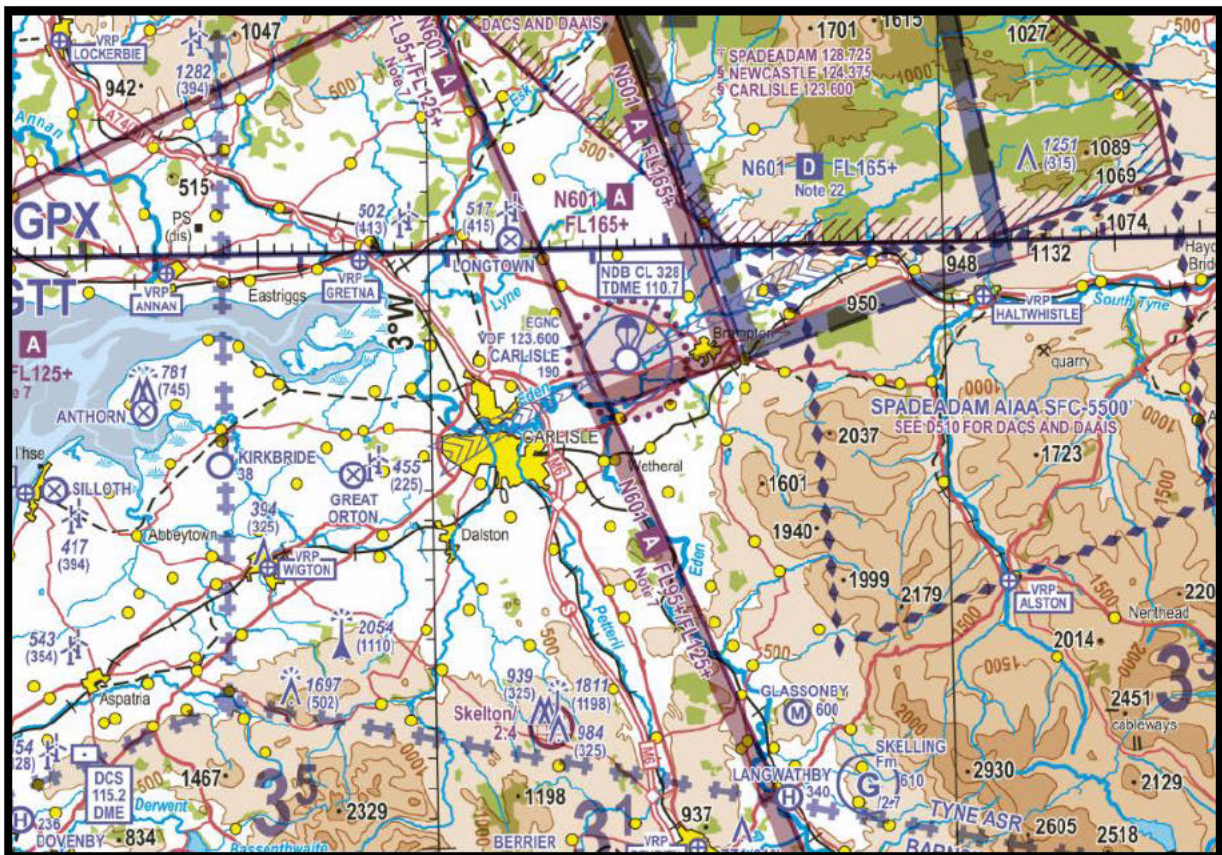
Carlisle Lake District Airport is proposing to introduce RNAV procedures and Point in Space (PinS) approaches which utilise GNSS for aircraft and helicopters arriving at the airport.

2 Justification for Change and Analysis of Change Options

2.1 Current Airspace Arrangements and Operations

2.1.1 Airspace

Carlisle Lake District Airport is located within uncontrolled Class G airspace, where aircraft are not subject to mandatory compliance with ATC instructions and are only required to adhere to a small set of compulsory flight rules. Aircraft can enter, leave and transit the airspace near the airport without permission from Carlisle ATC. Carlisle Lake District Airport has an Aerodrome Traffic Zone (ATZ) (Class G) of radius 2.0 nautical miles (nm) centred on the Aerodrome Reference Point (ARP). The ATZ extends from ground level to 2,000 feet (ft) above aerodrome level (aal). The ATZ is the only airspace established to provide a degree of protection to aircraft operating at the Airport during the most critical stages of flight. Pilots of aircraft within the ATZ, or those who request entry into the ATZ, are required to make their presence known to Carlisle ATC during Airport operating hours and comply with ATC instructions. Figure 1 below shows the current airspace structure surrounding the Airport.



Data included in this product reproduced under licence from NATS (Services) Ltd © Copyright 2019 NATS (Services) Ltd. All rights reserved.

Figure 1 – Carlisle Lake District Airport and the Current Surrounding Airspace Structure

2.1.2 Current Instrument Flight Procedures at Carlisle Lake District Airport

Aircraft that cannot make a visual approach are required to make an Instrument Approach and currently that means using the Non-Directional Beacon (NDB) and the Distance Measuring Equipment (DME). The existing NDB/DME approach for Runway 24 and Runway 06 respectively are pictured in Figure 2 and Figure 3 below. An NDB/DME approach is a non-precision instrument approach, which means that the tracks shown below may not necessarily represent where the aircraft will always fly. The pilot must interpret the information from the instruments and will alter course in order to route towards the runway threshold.

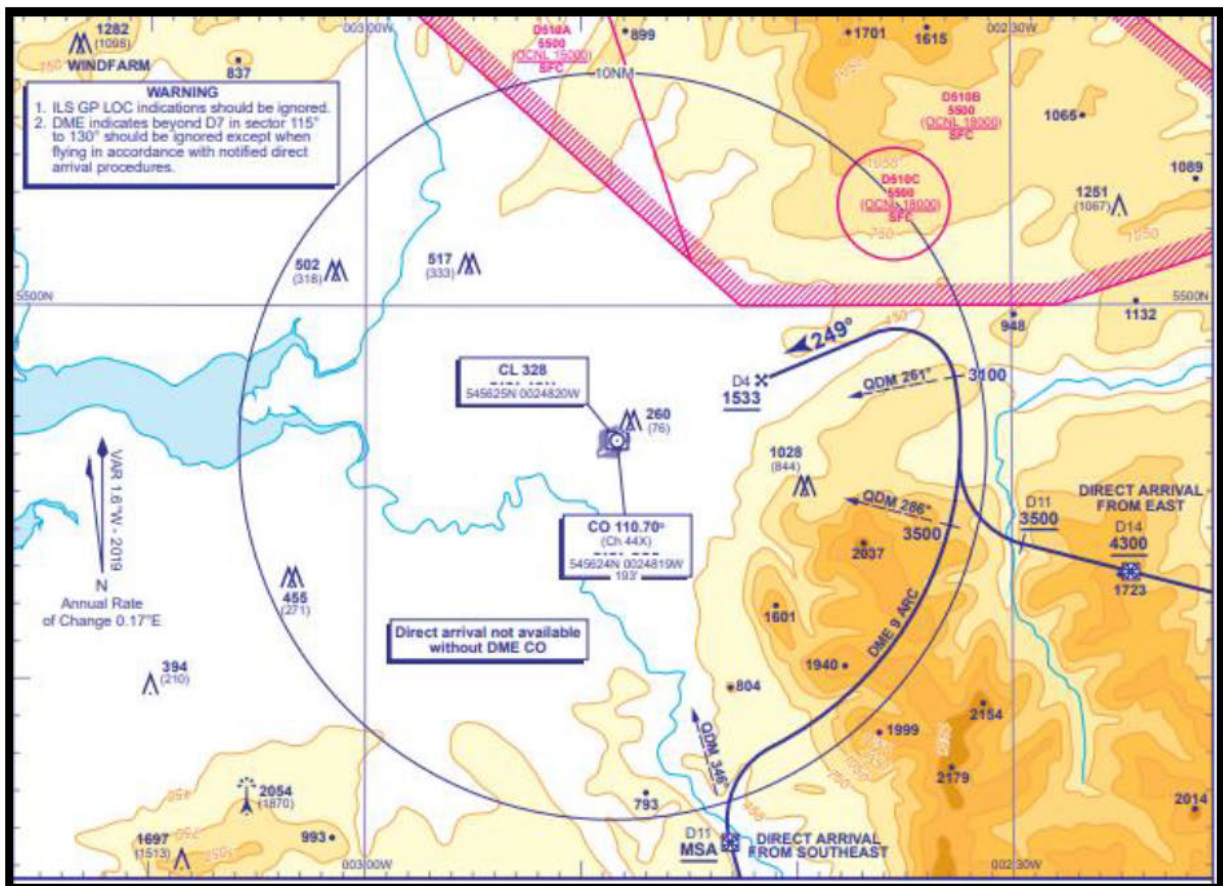


Figure 2 – Existing Runway 24 NDB/DME Instrument Approach at CLDA (Direct Approach)

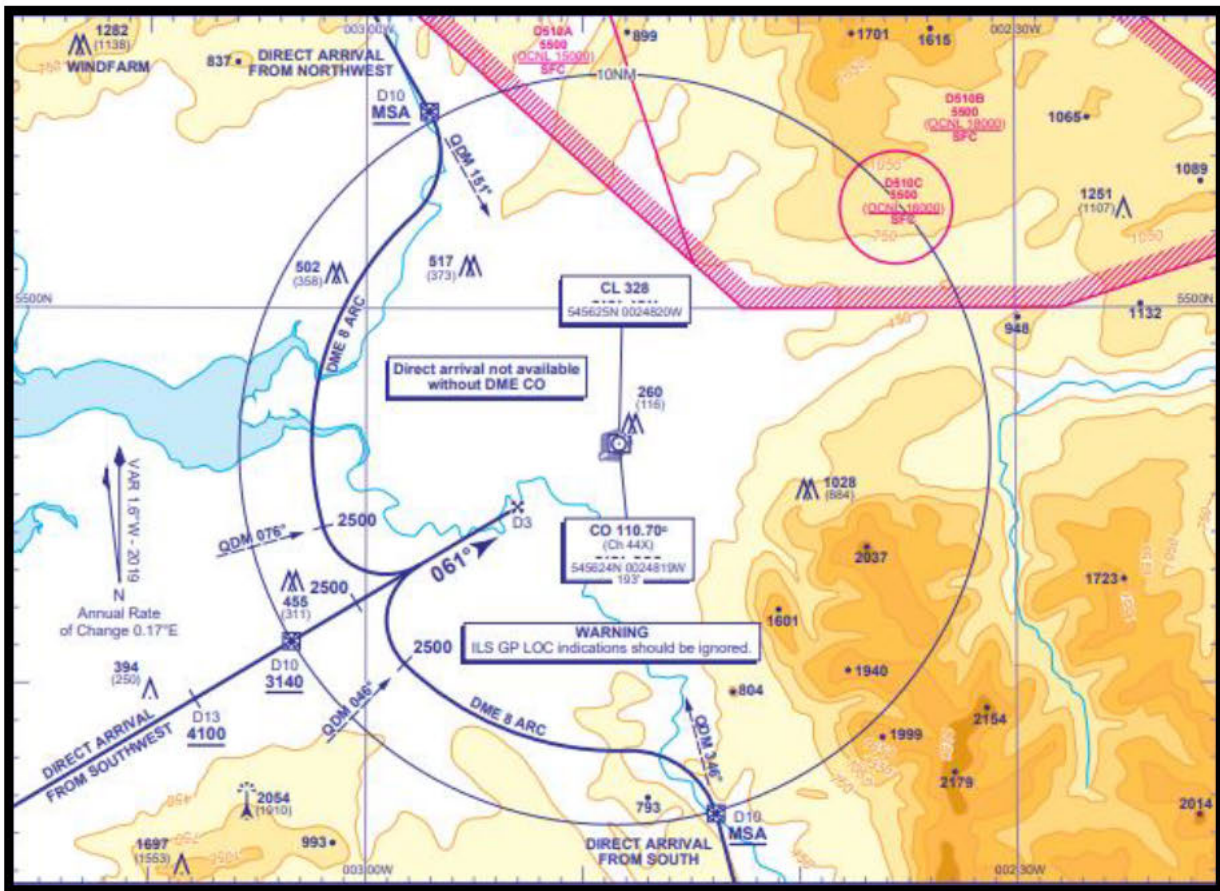


Figure 3 – Existing Runway 06 NDB/DME Instrument Approach at CLDA (Direct Approach)

2.1.3 Safety Issues Under Current Operational Procedures

There are no specific safety issues that this proposal is attempting to solve, but it is anticipated that with improved minima, the introduction of the new RNAV procedures will assist aircraft making approaches to Carlisle Lake District Airport during inclement weather.

2.2 Proposed Change to Airspace Arrangements

Following infrastructure work on the main runway, the runways have been renamed Runway 24 and Runway 06 (the Consultation material referred to Runways 07 and 25). This is due to magnetic variation change over time and is a change in nomenclature only. This change does not affect any routes over the ground that aircraft currently fly. The proposed new procedures are referred to with the new runway nomenclature.

Carlisle Lake District Airport is proposing to introduce RNAV (GNSS) procedures for aircraft landing on Runway's 06 and 24 and Point in Space (PinS) approaches for helicopters arriving for Runway's 01 and 19. The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation (ICAO) Document 8168 and CAA policy

guidance and regulations and are in line with best practices and standards across the UK.

2.3 Justification for Revised Instrument Flight Procedures (IFP)

Most aircraft operating in and out of Carlisle Lake District Airport rely on good weather with good visibility. However, during periods of poor weather, including low cloud and poor visibility, pilots will make use of the existing conventional navigational aid, the NDB/DME, to navigate safely and make an approach. The NDB and the DME use relatively old technology and supporting and maintaining this legacy equipment is challenging. If the navigational aid is out of service for technical reasons, pilots may not be able to make an approach if the weather conditions do not permit flight under Visual Flight Rules (VFR). There is no intention to remove the NDB or DME equipment since they will continue to be used by the majority of Carlisle Lake District Airport operators; however, there will come a time when maintaining the NDB/DME is no longer economically viable due to a lack of available spares.

The proposed new additional approaches will give more choice to pilots operating at Carlisle Lake District Airport. They can continue to utilise the conventional NDB/DME approach or, if they are suitably qualified and equipped, they could choose the new RNAV procedures that will not only provide lateral guidance but will also provide the pilot with vertical guidance information.

The proposed approaches for Carlisle Lake District Airport have been designed to replicate the existing procedures, where possible, in order to minimise any change in traffic patterns.

The key drivers for introducing the new procedures are as follows:

- Improvement to existing facilities to support IFR operations;
- To provide resilience to the existing IFR navigational facilities;
- To comply with the UK's commitment to ensure all airports have Performance Based Navigation (PBN) in service by 2024¹.

2.4 Defining the Options

The following options have been considered:

- Option 1 – Implement RNAV Procedures;
- Option 2 – Do Nothing;

2.5 Option 1 – Implement RNAV Procedures

The Airport's preferred option is to implement the RNAV (GNSS) approaches to Runways 06 and 24, and PinS approaches to Runway's 01 and 19. This will provide the redundancy required for the existing NDB/DME approaches and will ensure that the Airport complies with the CAA's commitment to the Future Airspace Strategy (FAS) to implement PBN at UK Airports by 2024. In addition,

¹ At the 2007 36th International Civil Aviation Organisation (ICAO) General Assembly, States agreed to Resolution 36/23, which urges all States to implement routes and airport procedures in accordance with the ICAO PBN criteria. EU Legislation, through the Common Pilot Project, instructs States to implement PBN through RNP1 by 2024.

the RNAV (GNSS) approaches will enhance the reliability of any passenger services that are introduced to the Airport in the future.

2.6 Option 2 – Do Nothing

If the Airport chooses to ‘Do Nothing’ i.e. it chooses not to introduce any RNAV (GNSS) approaches, it will have to rely on the NDB and DME for aircraft to make an approach during inclement weather. The NDB and DME use old technology and sourcing replacement parts in the event of failure will become increasingly more difficult. The European Aviation Safety Agency (EASA) has announced its intentions to include the ability to fly RNAV (GNSS) approaches within the syllabus for pilots studying for an Instrument Rating examination. This will mean that the flying schools that utilise Carlisle Lake District Airport for Instrument Flying Training will not be able to fulfil this element of the qualification at Carlisle. Carlisle Lake District Airport will not be able to comply with the UK FAS policy to introduce PBN by 2024.

For these reasons, the ‘Do Nothing’ option was not considered viable.

2.7 Justification for the Proposed Option

2.7.1 Improvement to existing facilities to support IFR operations:

Whilst this technology is relatively new, more and more aircraft are becoming RNAV equipped and more pilots are becoming qualified to fly RNAV approaches. Carlisle Lake District Airport has recently announced the commencement of scheduled passenger services between London Southend, Belfast and Dublin with effect from July 2019. This decision was taken irrespective of the outcome of this project, although the Airport was cognisant that the successful implementation of these procedures would be beneficial to the operator of the scheduled services in the future.

2.7.2 To provide resilience to the existing IFR navigational facilities:

The existing NDB and DME equipment at Carlisle Lake District Airport will continue to be utilised but this equipment is becoming obsolete so there is a requirement for a more robust and effective system of navigational aid. If the navigational aid is out of service for technical reasons and weather conditions do not permit flight under Visual Flight Rules, RNAV equipped aircraft will still be able to make safe approaches to the airport. There is no intention to remove the NDB or DME equipment since it will continue to be used by the majority of Carlisle Lake District Airport current operators.

2.7.3 To comply with the UK’s commitment to ensure all airports have Performance Based Navigation (PBN) in service by 2024:

The move to RNAV technology is in accordance with national and international initiatives to improve the navigational performance of aircraft. The development of RNAV (GNSS) Required Navigation Performance 1 (RNP1) is aligned with UK policy and is a cornerstone of the FAS.

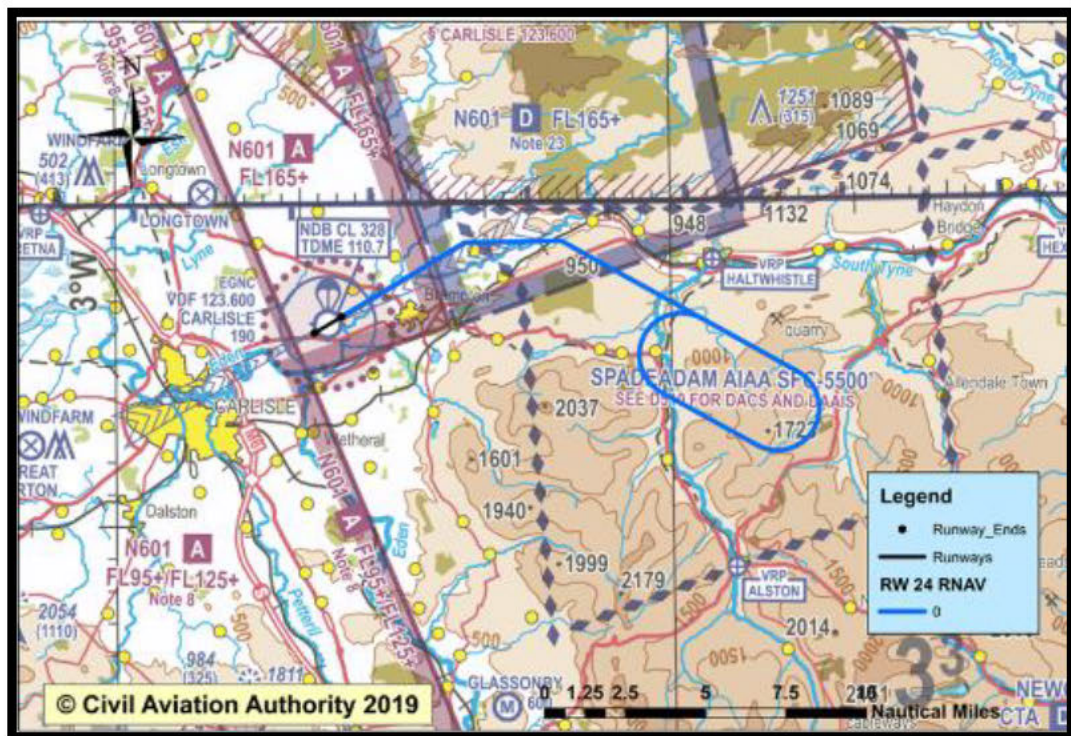
3 Preferred Option Airspace – Description at Consultation

3.1 Airspace Design

Since Carlisle Lake District Airport is only proposing to introduce RNAV procedures and Point in Space (PinS) approaches, there is no change proposed to the classification of airspace. The proposed approaches are designed to work within the parameters of the Class G airspace with the existing ATZ to provide a degree of protection to aircraft within the critical stages of flight.

3.2 Runway 24

The new RNAV procedure proposed for Runway 24 is shown in Figure 4 below:



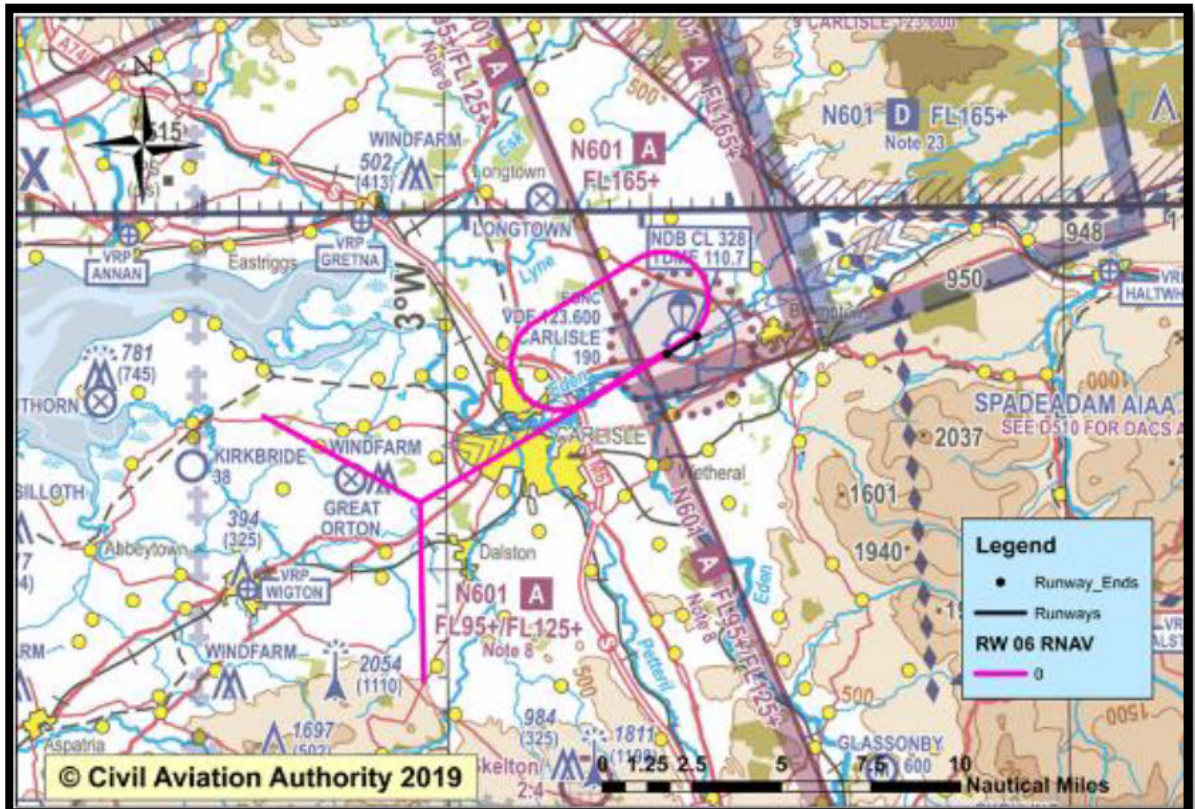
Data included in this product reproduced under licence from NATS (Services) Ltd © Copyright 2019 NATS (Services) Ltd. All rights reserved.

Figure 4 – Proposed Runway 24 RNAV Arrival Procedure at CLDA

3.3 Runway 06

The new RNAV procedure proposed for Runway 06 is shown in Figure 5 below. Whilst this approach overflies the city of Carlisle, the final approach replicates the existing NDB approach for Runway 07. The infrastructure work that has been undertaken at Carlisle Lake District Airport has resulted in a change of threshold

position for Runway 06. The threshold is now slightly closer to the edge of the airfield boundary, meaning that aircraft will touch down approximately 250 metres closer to the city than at present. To keep aircraft slightly higher on the final approach whilst flying over the city, the Runway 06 RNAV approach has been designed for aircraft to follow a 3.5° vertical path angle. This will also keep it consistent with the new approach designed for Runway 24.



Data included in this product reproduced under licence from NATS (Services) Ltd © Copyright 2019 NATS (Services) Ltd. All rights reserved.

Figure 5 – Proposed Runway 06 RNAV Arrival Procedure at CLDA

3.4 Aircraft Holds

The existing NDB hold in the Airport overhead has been replicated for use by aircraft utilising the RNAV (GNSS) approaches to each runway. Aircraft executing a Missed Approach procedure from the RNAV (GNSS) approach will enter the hold in the overhead. Two further holds were proposed at the Initial Approach Fix (IAF) for each runway. These holds were intended to provide additional flexibility to controllers who may be required to separate and sequence arrivals and departures. The Airport will now only be requesting one additional hold at the IAF for the RW 24 RNAV procedure.

3.5 Point in Space (PinS) Approaches

PinS approaches are non-precision approaches designed only for use by helicopters. They allow pilots to follow a set of obstacle-cleared GPS waypoints to allow them to position the aircraft to make a safe visual approach to the

runway. The Airport has developed PinS approaches to be aligned with the secondary Runways 19 and 01.

3.5.1 Runway 19

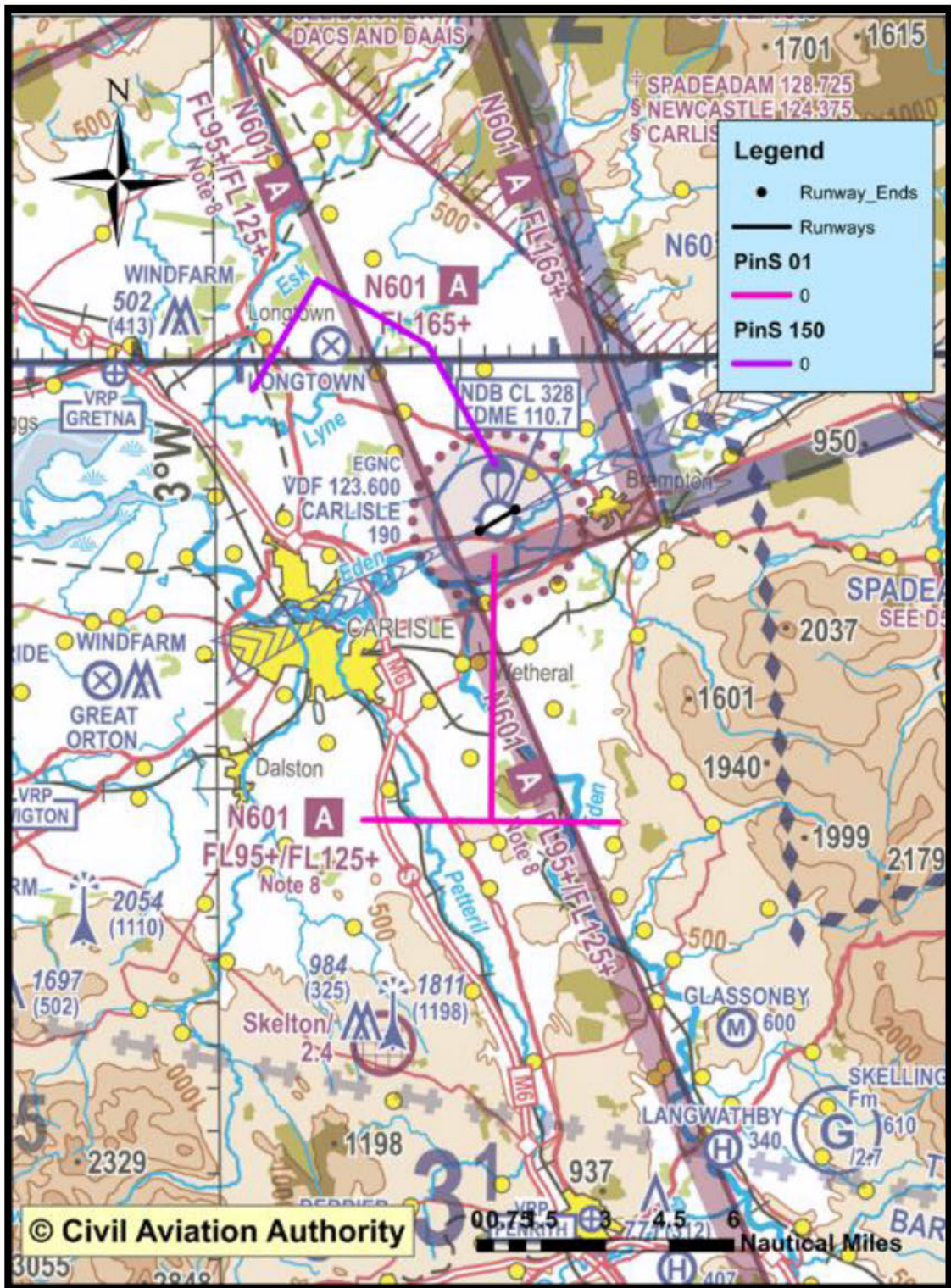
A standard 'T' design for the PinS approach to Runway 19 was not deemed practicable due to the proximity of the boundary to RAF Spadeadam danger area. In addition, if the approach was fully aligned to the runway, this would bring aircraft closer than is necessary to the boundary of the danger area. Therefore, an offset approach, aligned to a 150° track, has been proposed that will ensure that pilots executing this approach will remain clear of the danger area. The approach has also been designed to avoid overflight of any built-up areas, specifically the villages of Longtown and Hethersgill and also avoids overflight of Walton Moss National Nature Reserve. The proposed Runway 19 PinS approach is shown at Figure 6 below.

3.5.2 Runway 01

A standard 'T' design has been used for the PinS approach to Runway 01 since this area is sparsely populated and the 'T' design does not need to be modified to avoid other aviation areas. This allows pilots to commence the procedure from one of three points; either end of the 'T' or from the centre of the 'T'. The proposed PinS approach for Runway 01 is shown at Figure 6 below.

3.6 Proposed Implementation Date

If the CAA approves this application for the implementation of new RNAV Procedures, implementation is expected to be as part of AIRAC 13/2019 (5^h December 2019), or AIRAC 01/2020 (2nd January 2020).



Data included in this product reproduced under licence from NATS (Services) Ltd © Copyright 2019 NATS (Services) Ltd. All rights reserved.

Figure 6 – Proposed PinS Approaches – Runway 19 and Runway 01

4 Consultation Analysis Summary

4.1 Overview

This section summarises the aim of the consultation exercise, describes the aviation stakeholder consultee organisations and individuals that were consulted and provides a breakdown of the responses received. It also explores the support ratio of consultee responses received to give a general indication of the level of stakeholder acceptance of this proposal. The comprehensive Carlisle Lake District Airport ACP Consultation Feedback Report is included as Enclosure 2.

4.2 Consultation Summary

The proposed changes to the IFPs were published in the Carlisle Airport Consultation Document (Enclosure 3), presenting the proposal, the rationale for the change, the perceived effects and the mitigation measures proposed by the Airport. A link to the document was made available on the Carlisle Lake District Airport website and stakeholder organisations were notified by post, e-mail or online form, alerting them to the consultation and how to access the Consultation Document. The Consultation Document was made available for general distribution online through a dedicated link on the Carlisle Lake District Airport website. The consultation period ran from 4th January 2018 to 29th March 2018. The purpose of the consultation was to gather and analyse the views of stakeholders concerning the proposal to introduce RNAV (GNSS) procedures at Carlisle Lake District Airport. The Airport hosted drop-in sessions, giving the opportunity for interested parties to speak to members of the project team about the proposal. Details of these sessions were published on the Carlisle Lake District Airport website.

4.3 Aviation Stakeholder Consultee Organisations

The Carlisle Airport Consultation Document was circulated via post, email or online form to a total of 70 stakeholder consultee organisations, including 32 NATMAC organisations, comprising:

- 32 Aviation “National Organisations” (CAA National Air Traffic Advisory Committee (NATMAC list);
- 8 Airport Users;
- 7 Local Aerodromes/Flying Clubs;
- 15 Local Authorities;
- 6 Conservation and environmental charities; and
- 2 General Aviation organisations not included within the auspices of the NATMAC.

Of these, no emails or online forms were returned as undelivered or with errors. Therefore, the total number of consultees that received the consultation email was 70.

4.4 Consultation Responses

A total of 9 responses (12.9 %) to this consultation were received from the direct consultees. In addition to the 9 responses received from direct consultees, a further 30 submissions were received from other individuals or organisations making the total number of responses equal to 39.

MOD provided a consolidated response, through the Defence Airspace and Air Traffic Management (DAATM) organisation, on behalf of all military consultees. This is standard MOD practice.

Most of the responses received were from glider pilots and individuals associated with general aviation groups and organisations.

Of the 39 responses received during the consultation period:

- 11 consultees (28.2 %) supported the proposal;
- 21 consultees (53.8 %) objected to the proposal;
- 5 consultees (12.8 %) provided a neutral response or provided no comments on the proposal; and
- 2 consultees (5.1 %) asked questions for clarification purposes but did not formally provide a response.

4.5 Meetings with Local Stakeholders

Prior to the commencement of the consultation period, Carlisle Lake District Airport representatives met with RAF Spadeadam representatives on 5th October 2017 to present the proposed RNAV routes and to discuss any impact the introduction of the routes might have on operations in Danger Area EGD 510.

During the consultation period, Carlisle Lake District Airport hosted two drop-in sessions to allow anyone who may be affected by the proposed change to speak with members of the project team. The sessions were held on the afternoon and evening of 13th March 2018.

Following the completion of the consultation period, meetings with stakeholders continued. Details of the post-consultation meetings are given in Table 1.

Stakeholder	Meeting Date	Notes
Newcastle International Airport	June 2018 February 2019	Representatives from Carlisle Lake District Airport discussed with NIA representatives the feasibility of a Letter of Agreement (LoA); this work is ongoing.
Stanwix Rural Parish Council Meetings	24 August 2018	Members of the Stanwix Rural Parish Council visited Carlisle Lake District Airport to discuss the issues that they raised in their response.

Table 1 – Additional Consultation Meetings

4.6 Key Issues

The response analysis process identified a number of key themes in those responses that objected to the proposal. These are outlined in Table 2 below together with the number of consultees who expressed that view in their response.

Nature of Objection	Number of Responses
Restriction on glider flying / Runway 06 Hold area used extensively by gliders	18
Runway 06 Hold Area has adverse weather conditions	13
Increased risk of mid-air collision	6
Impact of noise / Impact on AONB	4

Table 2 – Nature of Objections Raised by Consultees

The overwhelming majority of objections to Carlisle Lake District Airport's ACP centre around the position of the proposed Runway 06 Hold at the IAF on the related rationales that the area is one of high glider activity, the area is prone to adverse weather conditions and the area is a popular tourist destination, so a potential increase in noise would be unwelcome. The majority of objections recommend that the hold point is moved to be over the Solway Firth. Four objections, including the response of Edensoaring Gliding Club, stated that they would remove their objections if the Runway 06 Hold was moved in this manner.

Newcastle International Airport (NIA) objected to the proposal because they considered that the Runway 24 Hold and approach procedure lie in the path of NIA's route to the west for both inbound and outbound traffic.

NATS provided no objection to the establishment of the proposed procedures; however, they sought clarification as to whether the existing inbound procedures for traffic from the en-route network would be changed in any way. Additionally, NATS requested that they receive notice of a planned implementation date to allow NATS Prestwick to conduct any necessary internal procedure/system changes and controller training/briefing.

The MOD, via DAATM, provided no objections to the proposal but offered a number of observations to be taken into account:

1. Due to the proximity of the proposed procedures to the Danger Area EGD 510, Carlisle Lake District Airport should be aware that some of the high-energy manoeuvres undertaken in the area may result in Airborne Collision Avoidance System (ACAS) alerts for aircraft undertaking the proposed procedures. Additionally, whilst training activities will be undertaken within EGD 510, military aircraft may choose to manoeuvre outside of the Danger Area, however they will be operating with the Rules of the Air.

2. DAATM also stated that in the interests of safety and to maintain operational output, the final proposal for Carlisle Lake District Airport procedures must not create any restrictions for MOD activity inside the Danger Area.

4.7 Consultation Conclusions Summary

The Consultation produced some moderate opposition from the GA community supported by the BGA and local gliding clubs. The main emphasis of the concerns are as follows:

- The proposed location of the Runway 06 Hold at the IAF is an area popular with the gliding community and would restrict the ability of gliders to operate there and increase their risk of mid-air collision;
- The proposed location of the Runway 06 Hold at the IAF is prone to severe weather conditions that would adversely affect aircraft operating there;
- The proposed location of the Runway 06 Hold at the IAF is directly overhead an area of outstanding natural beauty, and the noise of commercial aircraft would negatively impact tourism to the area.

Additionally, the Consultation received an objection from Newcastle International Airport based on the potential risk of conflict for aircraft under their control routing to and from the west and aircraft operating in the Runway 24 Hold.

5 Proposed Airspace Description

5.1 Post-Consultation Airspace Development

5.1.1 Position of Runway 06 Hold

The responses following the Public Consultation have been fully considered by Carlisle Lake District Airport and following a thorough review of the objections received and the potential options, Carlisle Lake District Airport has decided to remove the option for the Runway 06 Hold to the south west of the airport at the IAF. The Airport did not envisage the hold being used frequently, since the Airport used Runway 06 only 30% of the time, and the number of aircraft that are expected to use the RNAV procedures is expected to be low in the short term. Therefore, in response to those who objected to the design primarily because of the establishment of a hold at the Runway 06 IAF, the Airport has decided to remove this from the submission.

5.1.2 Interaction with Newcastle International Airport (NIA)

Carlisle Lake District Airport has held several discussions with NIA to discuss the use of the RW 24 RNAV hold. Both airports agree that any concerns can be mitigated by a Letter of Agreement (LoA) and a first draft has been prepared. The full detail has yet to be agreed with both Airports and this work is ongoing.

5.2 Proposed Instrument Flight Procedures

Approach Applications which are classified as RNP Approach (APCH) in accordance with International Civil Aviation Organisation (ICAO) Doc 9613 Performance Based Navigation (PBN) Manual (and ICAO state Letter SP 65/4-10/53) give access to minima (on an Instrument Approach Procedure) for all suitably equipped aircraft. The instrument approach procedures associated with RNP APCH are entitled RNAV (GNSS) to reflect that GNSS is the primary navigation system. The proposed IFPs for Runway's 24 and 06 respectively are shown in Figure 7 and Figure 8 below.

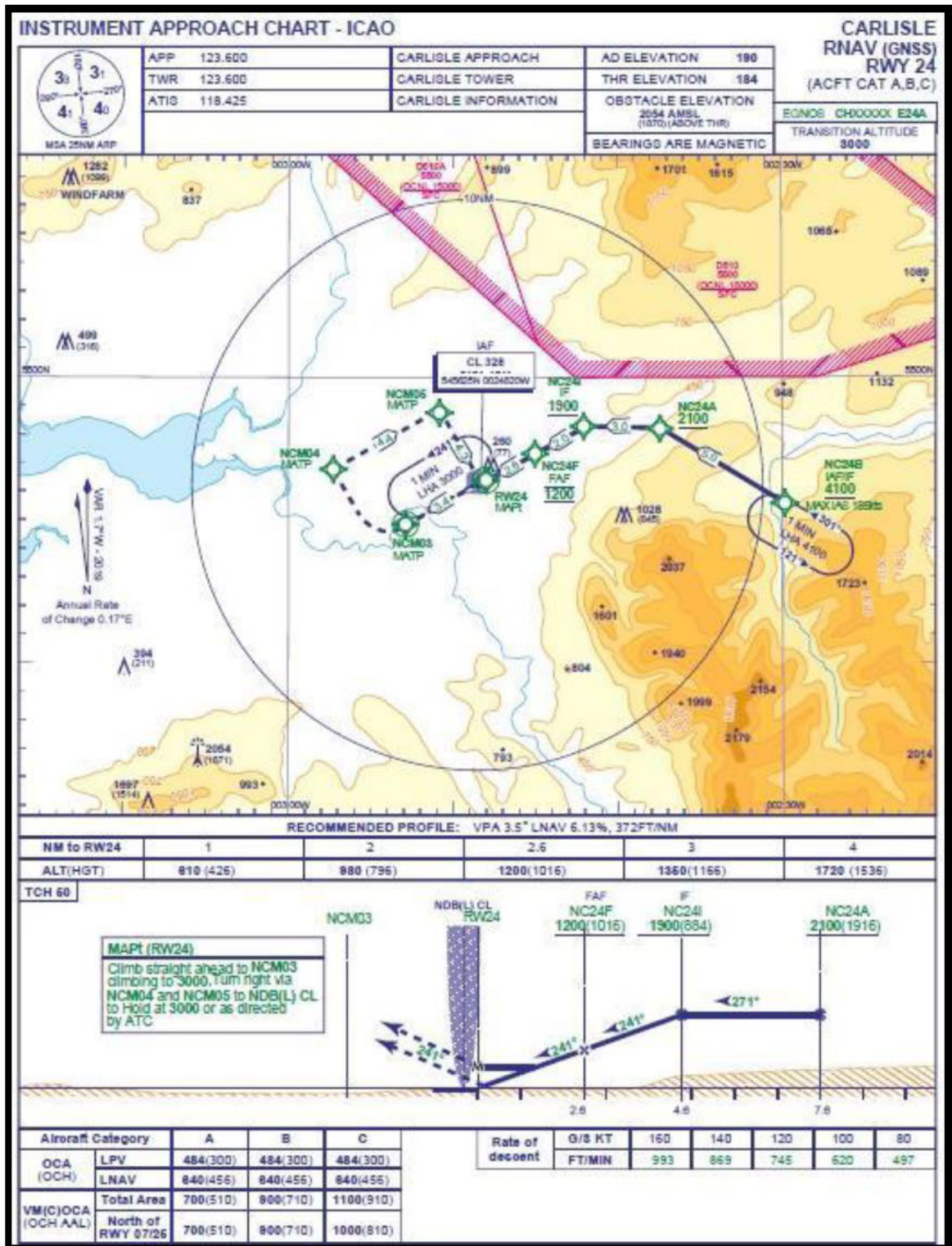


Figure 7 – Proposed CLDA RNAV(GNSS) Approach Runway 24

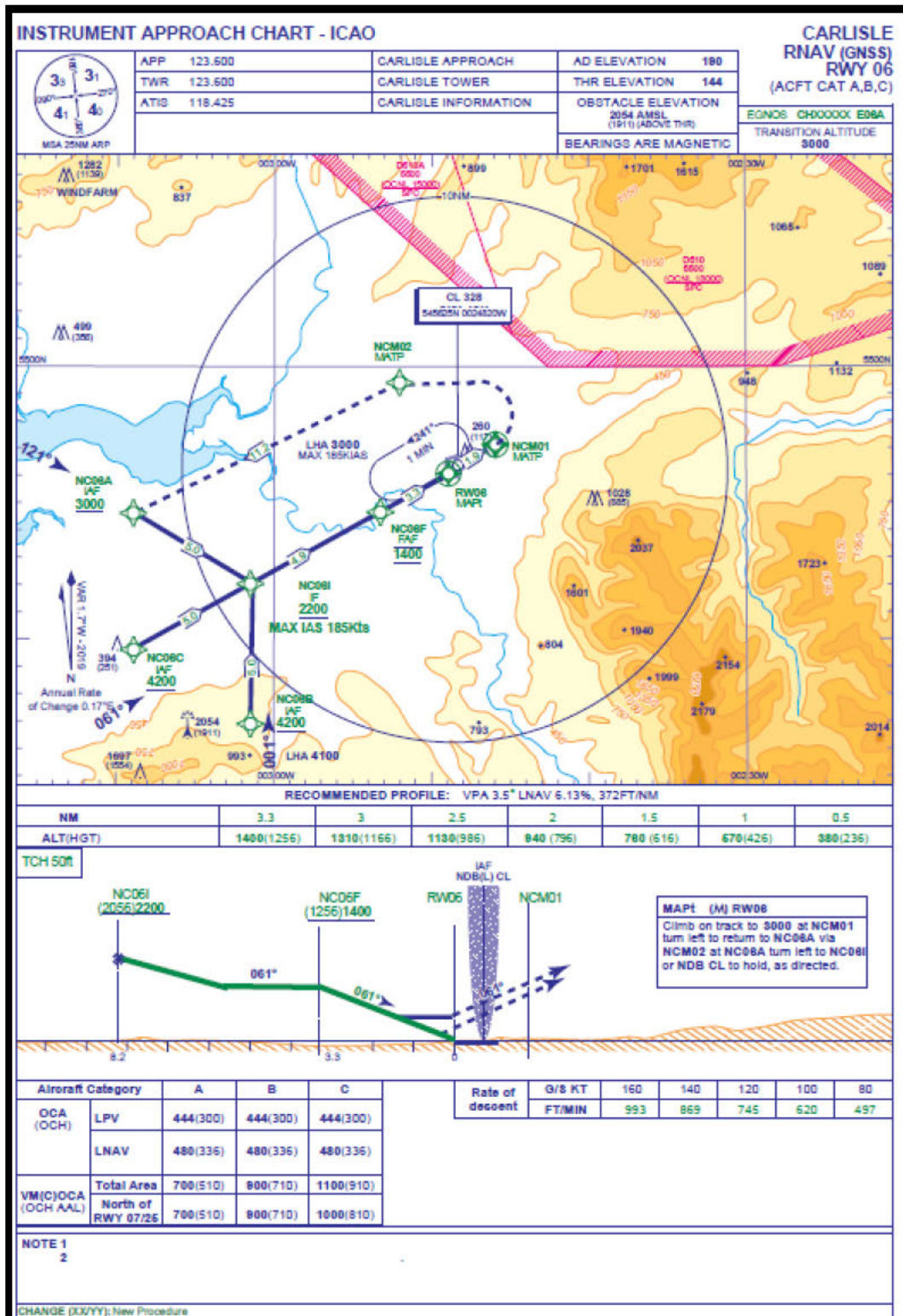


Figure 8 – Proposed CLDA RNAV(GNSS) Approach Runway 06

5.3 Proposed Point in Space (PinS) Approaches

The proposed IFPs for Runway 19 and 01 respectively are shown in Figure 9 and Figure 10 below.

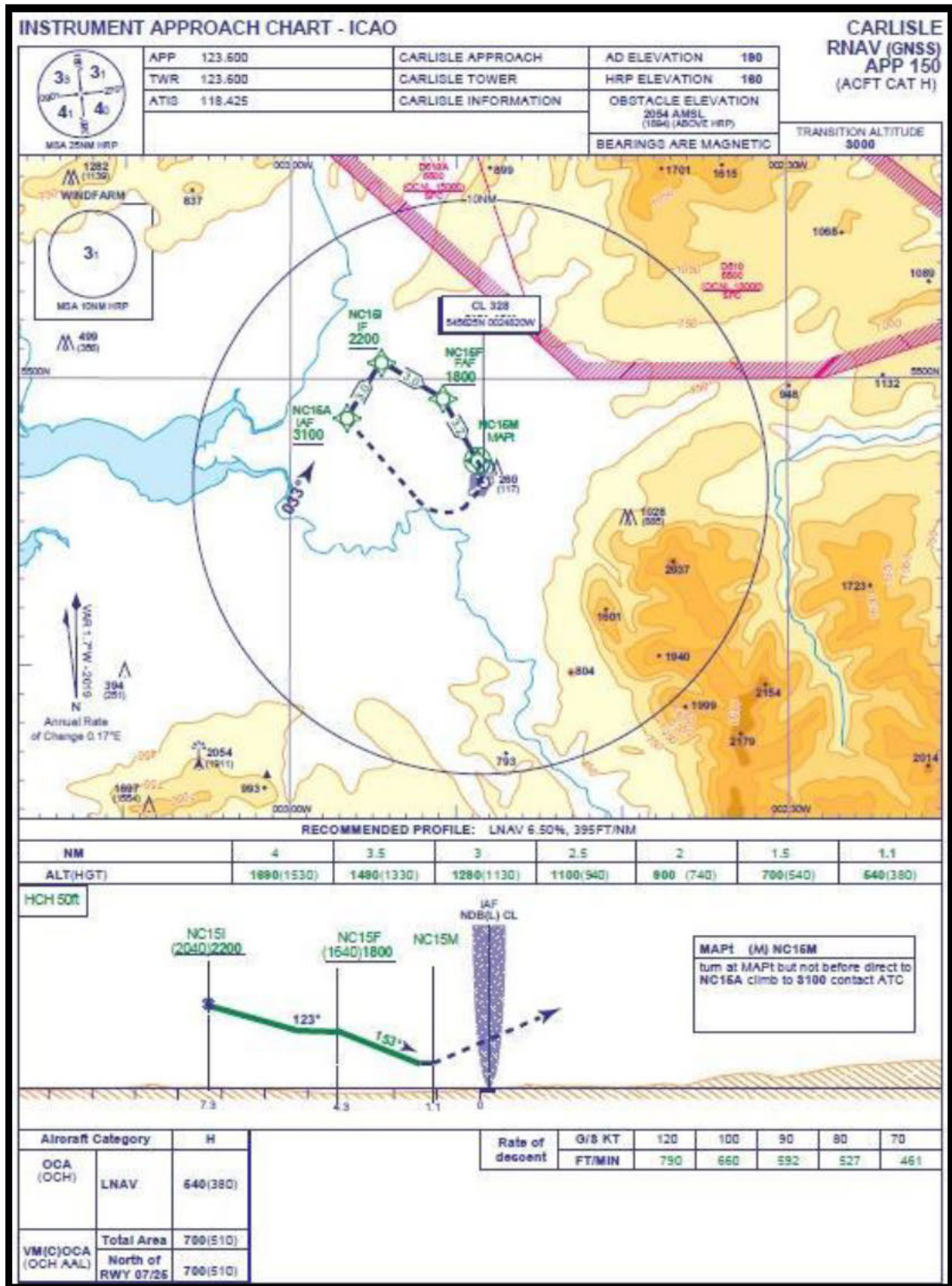


Figure 9 – Proposed CLDA RNAV(GNSS) PinS Approach Runway 19

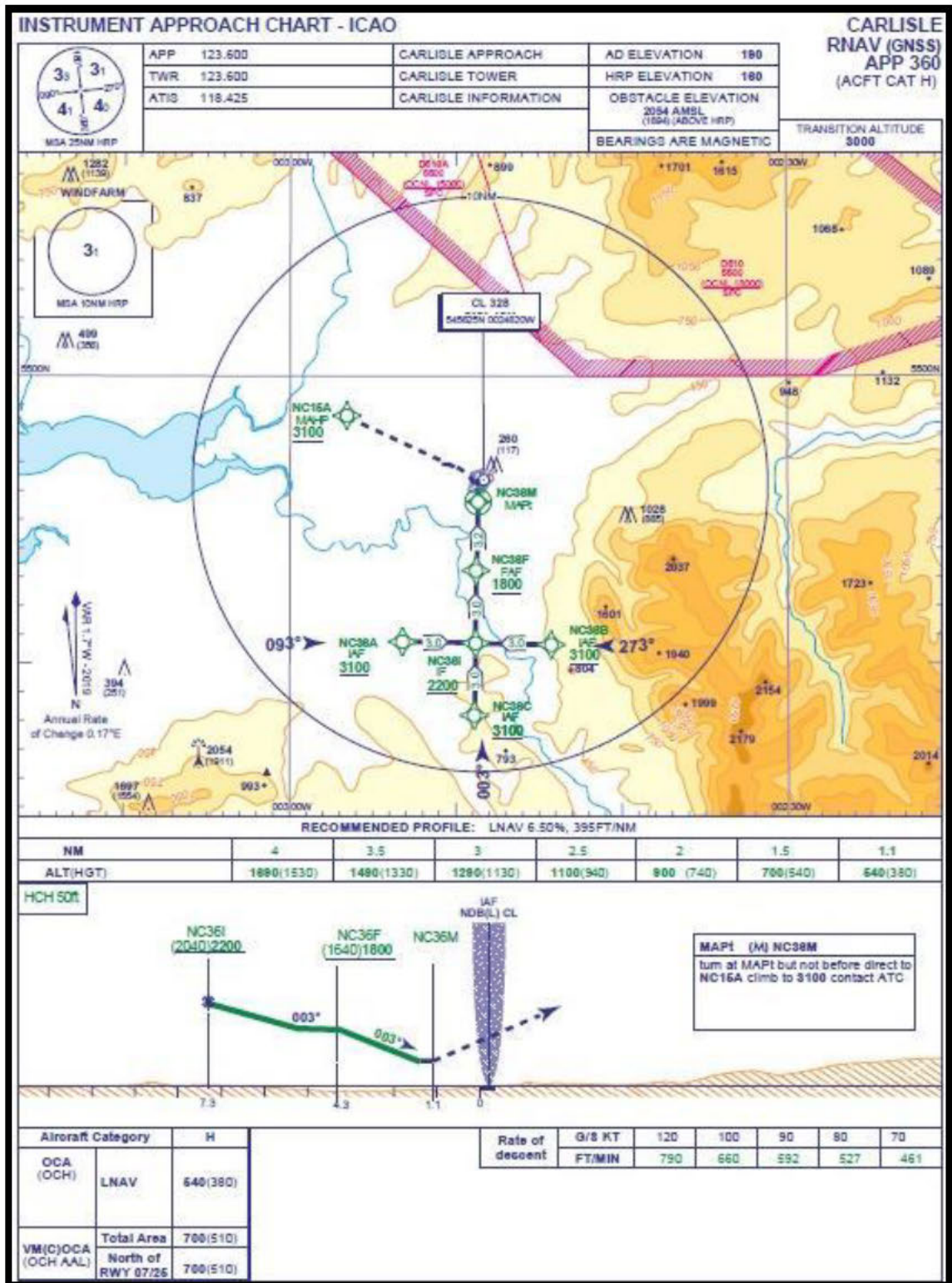


Figure 10 – Proposed CLDA RNAV(GNSS) PinS Approach Runway 01

5.4 Hours of Operation

Carlisle Lake District Airport has recently announced the launch of scheduled passenger services with effect from 4th July 2019. In order to ensure that the Airport has sufficient Air Traffic Control Officers available to support the operation, the opening hours have been amended. The proposed opening hours to support the scheduled services would also support the new RNAV (GNSS) IFPs. The Airport will be open as per the hours shown in Table 3 below. Until ATCO numbers increase, the Airport will provide an A/G service only on Tuesdays and Wednesdays.

Mon, Thu, Fri, Sat and Sun	Tue and Wed
0700 – 1900L	0900 – 1800L

Table 3 – Carlisle Lake District Airport ATC Planned Operating Hours

5.5 Interaction with Existing En-Route Structures and ANSPs

No new airspace is being proposed. Carlisle Lake District Airport will remain in uncontrolled Class G airspace with no connectivity to existing en-route structures and Controlled Airspace (CAS). For inbound aircraft, the Tay Sector Controller at Prestwick Centre (PC) calls Carlisle Airport with an estimate, and the Carlisle Controller will provide a safe level for the aircraft to proceed to the NDB hold (CL), a conspicuity squawk and a frequency. Aircraft wishing to fly an RNAV approach will also be passed a safe level to the overhead RNAV hold or to RW 24 RNAV hold.

5.6 Current and Forecast Traffic Data

The majority of aircraft movements at Carlisle Lake District Airport are light single engine aircraft (General Aviation – GA) that utilise the Airport, either as visitors or Carlisle Lake District Airport based aircraft from the flying schools. The number of annual aircraft movements since 2013 is shown in the Table 4 below.

Year	Total	Air Transport	Aero Club	Private	Business Aviation	% Change (of Total)
2018	4,330*	356	2,209	1,005	553	-75.2%
2017	17,439	688	12,997	2,802	547	-12.0%
2016	19,826	676	13,515	4,280	567	+7.6%
2015	18,427	570	12,230	4,135	583	+12.2%
2014	16,427	464	11,019	3,366	475	-4.9%
2013	17,280	558	11,206	3,360	399	N/A

Table 4 – CLDA Aircraft Movement Data

The announcement of the introduction of scheduled passenger services between London Southend, Belfast and Dublin is initially expected to increase the number of aircraft movements by approximately four per day (two arrivals and two departures). It is highly likely that if the implementation of these procedures is successful, and the aircraft operator is suitably equipped, these aircraft will choose to utilise the RNAV approaches on arrival.

Aircraft movements at Carlisle Lake District Airport have remained steady since 2013 and the Airport does not foresee any significant increase in aircraft movements in the future. The reduction in air traffic movement numbers in 2018 is attributed to the runway closure to enable the infrastructure upgrade to the runways. The Airport has analysed the number of aircraft expected to utilise RNAV (GNSS) approaches and this is likely to equate to less than 10% of aircraft arriving at Carlisle Lake District Airport.

Runway 24 is used most frequently due to the wind in the region being mainly from the west. For the UK as a whole, the prevailing wind is usually from the west or south west for approximately 70% of the time.

5.7 Draft Letters of Agreement and Memorandum of Understanding

5.7.1 Newcastle International Airport (NIA)

Newcastle International Airport considered that the Runway 24 Hold and approach procedure had the potential for conflict with aircraft under of NIA's control routing to and from the west.

Following the response received from NIA, Carlisle Lake District Airport has liaised with NIA to discuss the concerns raised during consultation. Both airports have agreed that any concerns could be mitigated with a Letter of Agreement (LoA) to ensure both airports are able to continue to operate safely and efficiently following the implementation of the proposed procedures. This work is ongoing; a draft LoA has been produced but it currently lacks sufficient detail to be included within this submission.

5.7.2 Spadeadam Electronic Warfare Tactics Range (EWTR)

Carlisle Lake District Airport has elected to utilise an offset PinS approach for Runway 19 to increase the distance between the procedure and Danger Area EGD 510 Spadeadam EWTR. Carlisle Lake District Airport has also engaged with RAF Spadeadam to produce an agreed method of operations to ensure that RAF Spadeadam ATCOs are aware of any RNAV approaches that may come close to the boundary of EGD 510. The Airport already has an MOU in place, which was reviewed in June 2018; it will be reviewed again prior to commencement of commercial operations and will be reviewed again prior to the implementation of the new IFPs. Details of the existing MOU is included at Enclosure 1.

5.8 Airspace Design Compliance with ICAO Standards and UK Policy

The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation

(ICAO) PANS-OPS Document 8168 and CAA policy guidance and regulations and are in line with best practices and standards across the UK.

5.9 Plans and Procedures for Equitable Access

The proposed procedures will be contained within uncontrolled Class G airspace and as such there will be no access restrictions on other airspace users. Aircraft operating VFR will be responsible for maintaining a safe separation from other aircraft under the 'see and avoid' principle.

6 Supporting Infrastructure and Resources

6.1 Surveillance Infrastructure

Carlisle Lake District Airport does not operate with either primary or secondary radar. However, it does operate with an SSR conspicuity code (4677). Aircraft utilising RNAV approaches at Carlisle Lake District Airport will use this conspicuity code so that other Air Traffic Service Units (ATSUs) can request traffic information via Carlisle Airport ATC.

6.2 Communications Infrastructure

The UK Aeronautical Information Publication (AIP) states that the Designated Operational Coverage (DOC) is 25 nm up to 6,000 ft. The proposed procedures fall within these parameters.

6.2.1 Contingency Operations

Carlisle Lake District Airport has five independent VHF radio systems backed by UPSs and a standby generator. In the event of radio failure, standard radio failure procedures (UK AIP) should be followed.

6.3 Staffing Availability and Qualifications

Following its programme of development, Carlisle Lake District Airport has entered a new commercial arrangement with ANS Ltd to provide ATCOs to support the Carlisle operation. The new ATCOs are currently undergoing training using simulators at Edinburgh Airport and will be back on site, qualified to operate on 20th May 2019. The Airport expects to provide a fully Scheme for the Regulation of Air Traffic Controllers' Hours (SRATCOH) compliant watch roster that provides Aerodrome Control Instrument (ADI) Air Traffic Service (ATS) and Approach Procedural Service (APP). As mentioned in Section 5.4 above, until ATCO numbers increase, there will be no ATC ADI or APP provided on Tuesdays and Wednesdays; instead an Air/Ground service will be provided to local operators. The scheduled services will not be operating on Tuesdays and Wednesdays. The Airport now has a robust plan in place to provide ATS to support the launch of scheduled passenger services and by default, the new RNAV (GNSS) IFPs, if this application is successful.

6.3.1 Contingency Operations

The commercial operation has been limited to five days in any one week in order to allow currently employed ATCOs to complete the relevant training and to validate on site which will serve to provide resilience to the service for the future.

7 Operational Impact

7.1 Impact on other ANSPs

7.1.1 NATS

During the consultation phase, NATS sought clarification as to whether the establishment of the proposed procedures would alter the existing inbound procedures between NATS and Carlisle Lake District Airport ATC for traffic from the en-route network in any way. Additionally, NATS requested that they receive sufficient notice of a planned implementation date to allow NATS Prestwick to conduct any necessary internal procedure/system changes and controller training/briefing. The implementation of the RNAV procedures will not affect the current operational arrangements between NATS Prestwick and Carlisle Lake District Airport.

7.1.2 Newcastle International Airport (NIA)

Newcastle International Airport considered that the Runway 24 Hold and approach procedure had the potential for conflict with aircraft under of NIA's control routing to and from the west.

Following the response received from NIA, Carlisle Lake District Airport has liaised with NIA to discuss the concerns raised during consultation. Both airports have agreed that any concerns could be mitigated with a Letter of Agreement (LoA) to ensure both airports are able to continue to operate safely and efficiently following the implementation of the proposed procedures. This work is ongoing; a draft LoA has been produced but it currently lacks sufficient detail to be included within this submission.

7.2 Impact on Commercial Air Transport

The volume of IFR movements at Carlisle Lake District Airport is very low and is not expected to increase as a result of this ACP. Despite the low volume of movements, Carlisle Lake District Airport has considered the safety implications of multiple aircraft undertaking instrument approaches simultaneously. As a result, Carlisle Lake District Airport is introducing a more rigid PPR booking system to deconflict the planned commercial movements with other IFR aircraft.

7.3 Impact on General Aviation Users

The volume of IFR movements is not expected to change as a result of this ACP, nor is the controller workload increased whilst an aircraft is undertaking an RNAV approach (when compared to a standard IFP) therefore the level of service to VFR General Aviation operators is not expected to change.

Many of the responses received from the GA community during the consultation phase referred to a consideration that the risk of conflict or collision would increase as a result of the introduction and position of the Runway 06 Hold. The removal of the Runway 06 Hold from the procedures mitigates these concerns.

The position of other local aerodromes was considered during the design process and it was determined that the procedures were unlikely to have an impact on any other local aerodromes.

7.4 Impact on Military Users

7.4.1 Spadeadam EWTR

The procedures have been designed to keep aircraft on approach to Runway 24 at Carlisle Lake District Airport clear of Danger Area EGD 510. Carlisle Lake District Airport has engaged with RAF Spadeadam to produce an agreed method of operations to ensure that RAF Spadeadam ATCOs are aware of any RNAV approaches that may come close to the boundary of EGD 510. Additionally, whilst training activities will be undertaken within EGD 510, military aircraft may choose to manoeuvre outside of the Danger Area; however, they will be operating within the Rules of the Air.

Due to the proximity of the proposed procedures to the Danger Area EGD 510, Carlisle Lake District Airport should be aware that some of the high-energy manoeuvres undertaken in the area may result in Airborne Collision Avoidance System (ACAS) alerts for aircraft undertaking the proposed procedures.

The Defence Airspace and Air Traffic Management (DAATM) organisation stated that in the interests of safety and to maintain operational output, the final proposal for Carlisle Lake District Airport procedures must not create any restrictions for MOD activity inside the Danger Area. A Memorandum of Understanding (MOU) is in place with RAF Spadeadam; it was reviewed in 2018 and will be reviewed again prior to the commencement of commercial operations. It will also be reviewed prior to the implementation of the new IFPs.

7.4.2 Military Aircraft Flying Within the UK Low Flying System (UKLFS)

Military aircraft flying within the UKLFS (Class G airspace below 2,000 ft above ground level (agl)) operating VFR will be responsible for maintaining safe separation from other aircraft under the 'see and avoid' principle. As there is no change to the existing airspace structure and the proposed procedures will be within uncontrolled Class G airspace in line with current procedures, there will be no additional impact on military aircraft flying in the UKLFS.

7.5 Impact on Existing Procedures and Capacity

Carlisle Lake District Airport will be providing an Approach Procedural (APP) Control service combined with an Aerodrome Instrument Control (ADI/TWR) service as there is no radar surveillance capability at the Airport. The introduction of RNAV procedures is not expected to increase the levels of instrument traffic. Instead, the intent is to offer more options to the current levels of instrument traffic. Carlisle Lake District Airport will continue to maintain the NDB/DME equipment as the majority of aircraft that utilise the airport use this equipment. The level of instrument traffic at Carlisle Lake District Airport is very low, and in future the level of instrument traffic arriving and departing will be tightly controlled through a flight operations booking process. It is therefore expected that the complexity and workload of operations will not change significantly as a result of the introduction of RNAV procedures.

The new arrangement with ANS Ltd will ensure that ATS provision is sustainable for the foreseeable future. Therefore, the Airport will have capacity within ATC to support the new IFPs if the application is successful.

8 Economic and Environmental Impact

8.1 Introduction

Any sponsor that considers implementing a change to how an airport operates must consider the potential impact that the changes will have on the environment. Carlisle Lake District Airport has considered the potential environmental impact that the introduction of RNAV (GNSS) approaches might have in relation to the following:

- Traffic Forecasts;
- Impact of Noise;
- Tranquillity and Intrusion;
- CO₂ Emissions; and
- Local Air Quality.

Carlisle has analysed the number of aircraft expected to utilise RNAV (GNSS) approaches and this is likely to equate to less than 10% of aircraft arriving at Carlisle Lake District Airport. In 2016 there were a total of 19,826 aircraft movements; in 2017 the total number was 17,439.

8.2 Traffic Forecasts

8.2.1 Current Levels of Traffic

The Carlisle Lake District Airport ACP is not driven by a requirement or intent to increase the number of aircraft movements and it is important to reiterate that the introduction of RNAV procedures is independent of the re-introduction of commercial aircraft operations at Carlisle Lake District Airport, and the introduction of Commercial Air Transport (CAT) will only result in an average of 4 movements per day.

Over the last five years there have been fluctuations in the numbers of aircraft movements, however, there does not appear to be any identifiable trends.

Year	Total Number of Aircraft Movements	% Change of Total Number	Business Aviation	% Change in Business Aviation Flights
2012	17349		290	
2013	17280	-0.40%	399	+37.59%
2014	16427	-4.94%	475	+19.05%
2015	18427	12.18%	583	+22.74%
2016	19826	7.59%	567	-2.74%
2017	17439	-12.04%	547	-3.53%
2018	4,330 ²		553	+1.10%

Table 5 – Carlisle Lake District Airport Annual Aircraft Movement Data

8.2.2 5 Year Traffic Forecast

Carlisle Lake District Airport is currently reviewing its Master Plan. The focus of the last two years has been to oversee the major infrastructure programmes, ensure that there are sufficient ATCOs to support the existing operation, and to support the launch of scheduled passenger services. The priority for 2019 will be to establish those services before any future development plans can mature. Therefore, there are no forecast figures to support an increase in aircraft movements.

8.3 Impact of Noise

Noise contours have not been produced for Carlisle Lake District Airport in respect of this proposal. The introduction of the new RNAV (GNSS) procedures is not likely to attract any significant increase in traffic. As explained in Section 5 paragraph 5.6, the total number of aircraft movements at the Airport in 2016 was 19,826, of which 13,515 were associated with the Aero Club and would have been light single engine aircraft. There were 4,280 private aircraft, (types unknown) and 567 business aviation aircraft (types unknown). If the assumption is made that all of the private and business aviation aircraft were jet aircraft, this accounts for approximately 24% of the total traffic. At these levels, the calculation of noise contours is not likely to produce a result that would see noise contours extend much beyond the end of the runway. The planned introduction of scheduled passenger services will initially account for approximately two extra arrivals per day (and two departures) five days out of seven (i.e.20 extra movements per week); this would increase the annual movements by approximately 5%. Given that the initial aircraft will likely be no larger than Saab 340 (twin turbo-propeller), this increase is likely to be negligible in terms of noise contours.

² The reduction in air traffic movement numbers in 2018 is attributed to the runway closure to enable the infrastructure upgrade to the runways.

The proposal to introduce a 3.5° Vertical Path Angle (VPA) will help to keep aircraft flying this approach higher than would be expected for a 3° VPA. In addition, aircraft flying steeper approaches can utilise lower power settings. This will help to reduce noise exposure to those living under the flight path in Carlisle City when compared to a standard 3° approach. Runway 06 is only used on average 30% of the time due to the prevailing wind being mainly westerly.

8.4 Tranquillity and Visual Intrusion

Carlisle Lake District Airport is in a beautiful location, nestled between two designated AONBs. To the west of the Airport is the Solway Coast AONB, which was established to recognise the quality of the landscape and the significant historic and scientific interest. Aircraft approaching Carlisle Lake District Airport from the north-west and flying the procedure for Runway 06 are likely to overfly this area but would be at or above 3,000 ft above mean sea level (amsl).

To the east and southeast of the Airport is the North Pennines AONB. This is the second largest AONB within the UK and it recognises the peaceful, unspoilt landscape of sweeping moorland. This area is also designated as the Spadeadam Area of Intense Aerial Activity (AIAA) which recognises that the area is popular for recreational flying, and also military flying. The new procedure for Runway 24 will overfly the AIAA and the AONB. The Procedure Designer has attempted to replicate the existing NDB procedure, which also currently overflies the AONB. However, due to the design constraints of the RNAV (GNSS) approaches, the start of the new procedure is further to the east than the current procedure. The first waypoint is approximately 8 km (5 miles) to the north west of Whitfield (N54°55'10" W002°20'54" / NY777583). A hold based on this waypoint is also proposed. However, it should be borne in mind, that the hold within the overhead, which replicates the existing NDB hold, and will be used by aircraft executing a MAP, will be the most frequently used hold. This is the ATCOs' preferred hold since it is closer to the Airport.

The chances of a successful approach utilising an RNAV (GNSS) procedure is greater than that of a conventional approach as the information is more accurate. This reduces the number of aircraft that might execute a go-around because they are not correctly aligned with the runway. The establishment of a hold at the IAF will allow an aircraft with an emergency to hold until it is safe to continue the approach.

There is no restricted airspace within the vicinity of the proposed IAF hold, so it is anticipated that aircraft will not hold below the altitude of 5,000 ft amsl, which due to the high ground within the area, will mean a minimum of 3,300 ft agl. Since aircraft flying the Runway 24 RNAV (GNSS) arrival will be flying a 3.5° VPA, the aircraft will be higher when commencing the procedure, than if they fly a 3° VPA.

To the southwest of the Airport is the Lake District National Park, the largest National Park in England. The Lake District is considered to be one of England's most scenic regions and is the country's premier destination for hiking and climbing. Aircraft approaching Carlisle Lake District Airport from the south and flying the new procedure for Runway 06 are likely to overfly the National Park. However, they will be descending to the IAF from altitude so will have reduced power settings at this point.

8.5 Anticipated level of fuel burn/CO₂ Emissions

RNAV (GNSS) approaches are subject to stringent constraints during the design process. Each leg of the procedure is designed to ensure that aircraft can accurately position with minimal turns onto the final approach. Aircraft are able to be configured to the optimal settings for landing, all of which help reduce fuel burn, and therefore, CO₂ emissions. RNAV (GNSS) approaches have considerably more accurate guidance than those flying NDB approaches. This should mean that aircraft will have a potentially higher degree of success when positioning for landing, as aircraft will be guided with a higher precision to a position from which the pilot can continue visually. This should help to keep the number of aircraft that execute a 'go-around' due to an unstable approach to an absolute minimum.

8.6 Anticipated Effect on Local Air Quality

The Airport has considered the potential impact that the introduction of RNAV (GNSS) approaches is likely to have on local air quality within the vicinity of the Airport, below 1,000 ft. CAP 725 states that local air quality at ground level remains largely unaffected by aircraft emissions that take place above 3,000 feet agl because dispersion reduces concentration levels for these emissions. The new procedures have been designed to replicate the existing procedures as far as practicable, and there is unlikely to be a significant increase in aircraft movements in the foreseeable future, therefore there is unlikely to be any significant impact upon local air quality with the introduction of the proposed procedures.

The replication of the existing approaches means that there is unlikely to be any change in traffic patterns below 1,000 ft. Aircraft movements at Carlisle Lake District Airport have remained steady since 2013 (except for 2018 when the runway was not available due to the infrastructure upgrade programme) and the Airport does not foresee any significant increase in aircraft movements in the future. The number of aircraft that choose to utilise the new RNAV approaches on arrival is likely to be very similar to the number that utilise the current NDB/DME approach. As such, there is unlikely to be a significant impact upon local air quality with the introduction of the proposed procedures.

9 Safety Management

9.1 Purpose

The CAA publication CAP 725 provides detailed guidance on the Airspace Change Process. It requires a robust safety management process to be an integral part of any proposed Airspace Change, including the introduction of Instrument Flight Procedures (IFP).

The CAA Safety and Airspace Regulation Group (SARG) requires assurance that the changes introduced by the introduction of RNAV IFPs will result in safe air operations at all stages of the project lifecycle; this will be true of Carlisle and any other stakeholders impacted by the changes.

The form of this assurance is an operationally focused four-part Safety Case, in accordance with the Carlisle Airport Safety Management Manual (SMM).

The purpose of the Part 1 Safety Case Report is to provide the Safety Requirements that must be satisfied to ensure that the proposed RNAV IFPs will be acceptably safe when introduced into operational use and throughout its in-service usage. The Safety Case Part 2 Report is required to present evidence showing how the design of the RNAV IFPs meets the Safety Requirements derived in the Part 1 Safety Case Report. The purpose of the Safety Case Part 3 is to demonstrate that each stage of introducing the new RNAV IFPs into service has been assessed and is considered to be safe. The Safety Case Part 4 is required to present evidence showing how the safety of the RNAV IFPs will remain acceptably safe during use.

9.2 Safety Case Parts 1 and 2

The Safety Case Part 1 & 2 [Reference 3] is required to present a Safety Argument with the top-level safety claim that use of the new RNAV IFPs at Carlisle Lake District Airport will be acceptably safe when introduced into operational use and throughout their in-service usage.

9.2.1 Satisfaction of Safety Argument

The top-level safety claim (Claim 0) is that the Carlisle Lake District Airport RNAV IFPs will be acceptably safe when introduced into operational use and throughout their in-service usage.

Claims, Arguments and Evidence are provided within the SC which demonstrate that this claim is supported and can be achieved. Where evidence is not yet available (i.e. for transition into service and ongoing support), the evidence proposed as satisfaction of the argument is stated.

9.2.2 Compliance with Safety Objectives and Requirements

The Safety Case Part 1 & 2 derives Safety Requirements that reduce the risks associated with the implementation of RNAV IFPs at Carlisle Lake District Airport to an ACCEPTABLE level. The document demonstrates compliance with these Derived Safety Requirements.

9.2.3 Compliance with Regulatory Requirements

The proposed RNAV IFP designs along with compliance to the derived Safety Requirements demonstrates compliance to the applicable principles laid out in CAP 725 and CAP 785 [Reference 2].

9.3 Safety Case Parts 3 and 4

The purpose of the Safety Case Part 3 & 4 [Reference 4] is to present a Safety Argument and supporting evidence that use of the new RNAV IFPs at Carlisle Lake District Airport will be acceptably safe when transitioned into service and will remain acceptably safe in operation.

9.3.1 Compliance with Safety Objectives and Requirements

The Safety Case Part 1 & 2 [Reference 3] derives Safety Requirements that reduce the risks associated with the implementation of RNAV IFPs at Carlisle Lake District Airport to an ACCEPTABLE level. Compliance with the Derived Safety Requirements is provided within the document.

Where Safety Requirements have been partially met or conditionally met, then this has been articulated and any mitigation has been provided.

9.3.2 Compliance with Regulatory Requirements

The proposed RNAV IFP designs and satisfaction of the Derived Safety Requirements demonstrates compliance to the applicable principles laid out in CAP 725 and CAP 785.

9.4 Safety Summary

The Safety Case Part 1 & 2 [Reference 3] and Safety Case Part 3 & 4 [Reference 4] support the claim that the RNAV IFPs will be acceptably safe when introduced into service at Carlisle Lake District Airport and will continue to do so.

At this stage of the project, compliance to all the derived Safety Requirements cannot be demonstrated, since the evidence of compliance is not yet available. Compliance with the derived Safety Requirements will be demonstrated during the Transition into Service and the continued safe Operation and Maintenance phases of the project. Data currently available indicates that;

- Carlisle Lake District Airport has followed the ACP process defined in CAP 725 including compliance with Airspace and Infrastructure requirements in Appendix A, sections 11 to 14 inclusive of CAP 725.
- The IFPs have been designed in accordance with CAP 785, CAP778 and ICAO Document PANS-OPS 8168 by a UK CAA approved design organisation.
- Compliance with the Safety Objective for GNSS demonstrates compliance with ATS Requirements for RNAV (GNSS) Instrument Approach Procedures in CAP 670, section NAV07.

The information provides confidence in the progress to satisfying the overall Safety Requirements.

10 Airspace and Infrastructure Requirements

10.1 Introduction

A key element of an ACP is the requirement to demonstrate that the proposed airspace change complies with the Airspace and Infrastructure Requirements stipulated in CAP 725. This section will review the requirements and the evidence that Carlisle Lake District Airport is able to comply with them or is able to mitigate the requirement.

10.2 Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
The airspace structure must be of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and nonradar environments.	Mitigation	CLDA is not proposing to change any airspace therefore there is no airspace structure involved.
Where an additional airspace structure is required for radar control purposes, the dimensions shall be such that radar control manoeuvres can be contained within the structure, allowing a safety buffer. This safety buffer shall be in accordance with agreed parameters as set down in SARG Policy Statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace'.	Mitigation	CLDA is not proposing to change any airspace therefore there is no airspace safety buffer requirement. The procedures will not be contained in regulated airspace.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
<p>The Air Traffic Management (ATM) system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures.</p>	<p>Mitigation</p>	<p>CLDA is not proposing to change any airspace therefore there is no airspace structure involved. CLDA will provide prescribed separation between IFR aircraft in accordance with the criteria stipulated within provision of an APP service.</p>
<p>Air Traffic Control (ATC) procedures are to ensure required separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures.</p>	<p>Mitigation</p>	<p>CLDA is not proposing to change any airspace therefore there is no airspace structure involved.</p>
<p>Within the constraints of safety and efficiency, the airspace classification should permit access to as many classes of user as practicable.</p>	<p>Mitigation</p>	<p>The proposed procedures are within uncontrolled Class G airspace.</p>
<p>There must be assurance, as far as practicable, against unauthorised incursions. This is usually done through the classification and promulgation.</p>	<p>Mitigation</p>	<p>CLDA is not proposing to change any airspace therefore there is no airspace structure involved.</p>
<p>Pilots shall be notified of any failure of navigational facilities and of any suitable alternative facilities available and the method of identifying failure and notification should be specified.</p>	<p>Compliance</p>	<p>Failure of navigational facilities will be promulgated by NOTAM.</p>
<p>The notification of the implementation of new airspace structures or withdrawal of redundant airspace structures shall be adequate to allow interested parties sufficient time to comply with user requirements. This is normally done through the AIRAC cycle.</p>	<p>Compliance</p>	<p>Changes will be published via the normal AIRAC cycle.</p>

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
There must be sufficient R/T coverage to support the ATM system within the totality of proposed CAS.	Compliance	The UK Aeronautical Information Publication (AIP) states that the Designated Operational Coverage (DOC) is 25 nm up to 6,000ft. The proposed procedures fall within these parameters.
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, the Change Sponsor shall act to resolve any conflicting interests.	Mitigation	During the consultation phase a number of gliding organisations expressed concern over the position of the Runway 06 IAF Hold. This Hold has been removed from the proposed procedures.
There must be sufficient accurate navigational guidance based on inline VOR/DME 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.	Mitigation	The proposed RNAV procedures are not contained within existing ATS routes.
Where ATS routes adjoin Terminal Airspace there shall be suitable link routes as necessary for the ATM task.	Mitigation	The proposed RNAV routes do not connect with Terminal Airspace.

Airspace and Infrastructure Requirements	Compliance or Mitigation	Evidence of Compliance or Mitigation of the Requirement
All new routes should be designed to accommodate P-RNAV navigational requirements.	Compliance	The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation (ICAO) PANS-OPS Document 8168 and CAA policy guidance and regulations and are in line with best practices and standards across the UK. The proposed routes have been designed to RNAV 1 specifications.
If the new structure lies close to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered.	Compliance	The proposed Runway 24 RNAV procedure and Runway 19 PinS approach route close to the boundary of Danger Area EGD510 Spadeadam EWTR. CLDA has elected to utilise an offset PinS approach for Runway 19 to increase the distance between the procedure and EGD 510. CLDA has also engaged with RAF Spadeadam to produce an agreed method of operations to ensure that RAF Spadeadam ATCOs are aware of any RNAV approaches that may come close to the boundary of EGD 510.

Table 6 – Airspace and Infrastructure Requirements and Evidence of Compliance or Mitigation

11 IAIP Amendment

11.1 AD 2-EGNC-1 Carlisle Airport – Textual Data

11.1.1 EGNC AD 2.3 Operational Hours

To include details of the scheduled closure times for the compliant watch roster.

11.1.2 EGNC AD 2.18 Air Traffic Service Communications Facilities

To include details of the scheduled closure times for the compliant watch roster.

11.1.3 EGNC AD 2.22 Flight Procedures

Para 2 Procedures for Inbound Aircraft – amend to ‘DME/NDB or RNAV(GNSS) procedure’.

11.1.4 EGNC AD 2.24 Charts Related to an Aerodrome

AD 2-EGNC-8-X

Figure: INSTRUMENT APPROACH CHART RNAV(GNSS) RWY 06 (ACFT CAT A, B, C)–ICAO

AD 2-EGNC-8-Y

Figure: INSTRUMENT APPROACH CHART RNAV(GNSS) RWY 24 (ACFT CAT A, B, C)–ICAO

AD 2-EGNC-8-X-X

Figure: INSTRUMENT APPROACH CHART RNAV(GNSS) APP 150 (ACFT CAT H)–ICAO

AD 2-EGNC-8-X-Y

Figure: INSTRUMENT APPROACH CHART RNAV(GNSS) APP 360 (ACFT CAT H)–ICAO

11.2 AD 2-EGNC-8 Charts Related to the Airport

INSTRUMENT APPROACH CHART RNAV(GNSS) RWY 06–ICAO AD 2-EGNC-8-X

INSTRUMENT APPROACH CHART RNAV(GNSS) RWY 24–ICAO AD 2-EGNC-8-Y

INSTRUMENT APPROACH CHART RNAV(GNSS) APP 150–ICAO AD 2-EGNC-8-X-X

INSTRUMENT APPROACH CHART RNAV(GNSS) APP 360–ICAO AD 2-EGNC-8-X-Y

12 References

Reference	Name	Origin
1	CAP 725 CAA Guidance on the Application of the Airspace Change Process Fourth Edition March 2016	CAA
2	CAP 785 Approval Requirements for Instrument Flight Procedures for Use in UK Airspace March 2010	CAA
3	Carlisle Airport – Airspace Change Proposal Safety Case Part 1 & 2	CLDA
4	Carlisle Airport – Airspace Change Proposal Safety Case Part 3 & 4	CLDA

Table 7 – Table of References

A1 Glossary

Acronym	Meaning
aal	above aerodrome level
ACP	Airspace Change Process
ACAS	Airborne Collision Avoidance System
agl	above ground level
AGL	Aerodrome Ground Lighting
AIAA	Area of Intense Aerial Activity
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
ANSP	Air Navigation Service Provider
AONB	Area of Outstanding National Beauty
AR	Airspace Regulation
ARP	Aerodrome Reference Point
amsl	above mean sea level
APCH	Approach
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
ATZ	Aerodrome Traffic Zone
BGA	British Gliding Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication

Acronym	Meaning
CAS	Controlled Airspace
CAT	Commercial Air Transport
CLDA	Carlisle Lake District Airport
CO ₂	Carbon Dioxide
DAATM	Defence Airspace and Air Traffic Management
DME	Distance Measuring Equipment
EASA	European Aviation Safety Agency
EWTR	Electronic Warfare Tactics Range
FAS	Future Airspace Strategy
ft	feet
GA	General Aviation
GNSS	Global Navigation Satellite System
IAF	Instrument Approach Fix
IAIP	Integrated Aeronautical Information Package
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
km	kilometre
LEP	Local Enterprise Partnership
LoA	Letter of Agreement
m	metre
MAP	Missed Approach Point
MoD	Ministry of Defence
NATMAC	National Air Traffic Management Advisory Committee

Acronym	Meaning
NATS	National Air Traffic Service <i>Provider of en-route air traffic services in the Scottish and London Flight Information Regions and at some civil airports.</i>
NDB	Non-Directional Beacon
NIA	Newcastle International Airport
nm	nautical mile
NOTAM	Notice to Airmen
NO ₂	Nitrogen Dioxide
PBN	Performance Based Navigation
PinS	Point in Space
PPR	Prior Permission Required
RAF	Royal Air Force
RNAV	aRea NAVigation
RNP	Required Navigation Performance
SARG	CAA Safety and Airspace Regulation Group
SMM	Safety Management Manual
SSR	Secondary Surveillance Radar
UKLFS	UK Low Flying System
VFR	Visual Flight Rules
VOR	VHF Omni Directional Radio Range; a type of short-range radio navigation system for aircraft
VPA	Vertical Path Angle