

# **Hawarden Airport**

## **Proposal to Adopt GNSS Approaches and amend Conventional Instrument Flight Procedures at Hawarden Airport**

### **Airspace Change Proposal**

## **ISSUE 1.0**

22<sup>nd</sup> March 2018

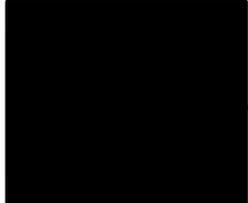
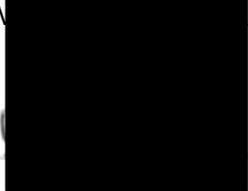
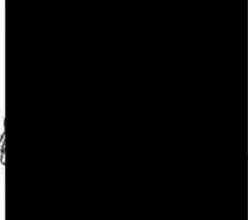
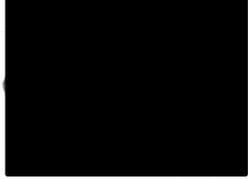
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## Introduction

Hawarden Airport is an EASA certificated aerodrome operated by Airbus Operations Ltd. Airbus Operations Ltd contracts the provision of Air Traffic Services (ATS) to Serco, who are an Air Navigation Service Provider (ANSP) approved under Article 7 of the European Commission Regulation 550/2004. In its capacity as an ANSP, Serco must satisfy the UK Civil Aviation Authority (CAA) as to their ability to provide safe and effective Air Navigation Services.

The Air Traffic Services Unit (ATSU) at Hawarden Airport currently provides services to aircraft to operate at the airport using both visual arrival and departure procedures and Instrument Flight Procedures (IFPs). The current conventional IFPs utilise ground based navigation aids. These conventional procedures require a regular review cycle, which occasionally identifies changes required to remain compliant with the current IFP design criteria. A recent review has identified several such changes. In addition, the primary airline ATI and the airport operators, Airbus wish to introduce Global Navigation Satellite System based approaches (GNSS approaches) at the airport. These changes fall within the scope of the Airspace Change Process.

In order to comply with its responsibilities for safety management of the ATS and ensure flight safety in the airspace in the vicinity of Hawarden Airport, Serco (on behalf of Airbus Operations Ltd) is submitting this Airspace Change Proposal (ACP) to establish GNSS approaches and amend the conventional Instrument Flight Procedures at Hawarden Airport.

CAA Civil Aviation Publication (CAP) 725 sets out the processes that are to be followed in applying for making a change to any airspace. This ACP has been developed in accordance with the requirements specified in CAP725.

CAP 725 requires the sponsor (Airbus) of the ACP to carry out a consultation with the airspace users who may be directly or indirectly affected by the change and with organisations representing those on the ground who may be affected by the environmental impact of the change. Serco have been contracted to act on behalf of the sponsor. This document is the ACP developed in accordance with the provisions of CAP725.

The body of this document describes in detail the various elements of the proposed airspace change, including the options that have been considered for each element. Through a process of option consideration and development, and taking into account external influences on the airspace configuration, Hawarden Airport has reached a balanced judgement on the changes presented in this consultation.

The process of the consultation is outlined in Annex B of this document, which will be released publicly as the Post Consultation Report. This report will also contain statistical analyses of the consultation results, some of the general topics raised and the next steps Hawarden ATC will take.

Annex A of this document is the Environmental Impact Assessment.

A number of Appendices provide amplifying detail where necessary, including a comprehensive Glossary of the aviation terminology used. Additionally, as the required changes affected by requirements arising from a number of UK, European and International Policies and Strategies, a list of source documents is included for reference by consultees.

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### List of Abbreviations

aal	above aerodrome level
ABAS	Aircraft Based Augmentation System
ACP	Airspace Change Proposal
ADI	Aerodrome Control Service (Instrument)
agl	above ground level
ALT	Altitude
amsl	above mean sea level
ANO	Air Navigation Order (2008)
ANSP	Air Navigation Service Provider
AOA	Airport Operator's Association
APS	Approach Control Service (Surveillance)
ARP	Aerodrome Reference Point
ATI	Airbus Transporte International
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
ATZ	Aerodrome Traffic Zone
BGA	British Gliding Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CCP	Continuous Climb Profile
CDA	Continuous Descent Approach
CTA	Control Area
CTR	Control Zone
DAATM	Defence Airspace and Air Traffic Management
DME	Distance Measuring Equipment
FAF	Final Approach Fix
FUA	Flexible Use of Airspace
GA	General Aviation
GNSS	Global Navigation Satellite System
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LJAO	London Joint Airspace Organisation
LP	Localiser Performance
LPV	Localiser Performance with Vertical Guidance
LNAV	Lateral Navigation
NATMAC	National Air Traffic Management Advisory Committee
NATS	National Air Traffic Services
NDB	Non-Directional Beacon
NDB (L)	Non-Directional Beacon (Locator)
nm	Nautical Mile
NWHGPC	North Wales Hang-gliding and Para Gliding Club
PANS-OPS	Procedures for Air Navigation - Operations
PSR	Primary Surveillance Radar
RMA	Radar Manoeuvring Area
RNAV	Area Navigation
RNP	Required Navigation Performance
RotAR	Rules of the Air Regulations (2007)

RTF	Radio Telephony
SARG	Safety and Airspace Regulatory Group
SBAS	Satellite Based Augmentation System
SID	Standard Instrument Departure
SOC	Standard Outbound Clearance
SSR	Secondary Surveillance Radar
STAR	Standard Arrival Route
TMA	Terminal Control Area
UK AIP	United Kingdom Aeronautical Information Publication
VFR	Visual Flight Rules
VNAV	Vertical Navigation
VRP	Visual Reference Point

## 1. Background information

### 1.1 History

1.1.1 Hawarden Airport was first opened on 4<sup>th</sup> September 1939 by Vickers Armstrong and has a long history of manufacturing, flying training, maintenance, corporate transport and commercial transport. Activities pertinent to this proposal are most relevant from the period of the 1970s onwards.

1.1.2 British Aerospace took over the operation of the airfield and factory and in the 1970s began an association with Airbus, who eventually took over operation of the factory and airfield

1.1.3 The site has been the centre of wing production for all Airbus aircraft since 1972. With the exception of A380, all aircraft wings are dispatched from Hawarden Airport by Beluga A300-600 Super Transporter aircraft. Additional factory staff communications to Bristol are currently provided under contract by Eastern Airways.

1.1.4 In addition to the production activity the airport also supports numerous other aviation activities, these include;

- Aircraft maintenance and overhaul by Aerocare Ltd.
- Aircraft maintenance and overhaul by Raytheon Systems Limited.
- General aviation from based operators.
- Fixed based corporate jet and turbo-prop aircraft.
- Aerial survey work by APEM Ltd.
- Police Air Support.
- Flying training by Flintshire Flying School & JD Aviation.
- Corporate aircraft handling by Chester Handling Services.
- Flying training for RAF Shawbury, RAF Valley and other RAF Units.
- Executive Aircraft Charter by Williams Aviation

1.1.5 In the past, scheduled services have operated to Liverpool, Heathrow, and The Isle of Man, although no schedules are currently operated.

### 1.2 Future

1.2.1 Airbus have a full aircraft order book for the foreseeable future. These orders will require a higher rate of wing production and consequently increased delivery flights by the fleet of 5 Beluga aircraft. This will increase to a rate of 10,000 flying hours of the fleet per year, equating to approximately 1200 Beluga movements per year at Hawarden Airport.

1.2.2 In 2019 Airbus will commenced a phased change from the current Beluga to the Beluga XL (a Super Transport version of an Airbus A330).

### 1.3 Current Aircraft Operations at Hawarden

- 1.3.1 Hawarden Airport is operated as an EASA certificated aerodrome by Airbus Operations Ltd. Airbus Operations Ltd contracts the provision of Air Traffic Services (ATS) to Serco, who are an Air Navigation Service Provider (ANSP) approved under Article 7 of the European Commission Regulation 550/2004.
- 1.3.2 The primary purpose of the airport is to facilitate the transport of wings and large components for the production of Airbus aircraft; this is achieved using a fleet of 5 x A300/600 Super Transporter aircraft which have been in service for 16 years. In 2019 this role will be phased over to the replacement A330 XL Super Transporters.
- 1.3.3 In addition to the freight operations, site to site transport for Airbus staff is undertaken (currently contracted to Eastern Airways using E145, E170, JS41 or Saab 2000 aircraft). Over and above this, several maintenance organisations are based at the airport together with several flying training organisations, based corporate aircraft, aerial surveying companies and visiting aircraft of various sizes and weights. Hawarden is also frequented by non-based flying organisations for instrument navigation training including Shropshire Aero Club, RAF Valley & RAF Shawbury.
- 1.3.4 Aviation movements at Hawarden for 2017 were 18,007 and are forecast to be in the region of 20,000 for 2018. Of these, 1202 in 2017 were Airbus Transporte International (ATI) flights, planning to rise to 1,400 in 2018 and plateau at 1,600 in 2019. A moderate increase in overall movements is expected over the coming years in line with national forecasts.
- 1.3.5 ATI has stated a company requirement to have GNSS procedures at Hawarden to align with similar requirements at all other airports the airline operates to. Numerous other based and non-based operators have also made clear the advantages of having GNSS procedures available at Hawarden for their own operations.
- 1.3.6 In addition to the implementation of GNSS approaches, a routine review of conventional IPPs identified some changes required which may have an impact on both aviation and non-aviation stakeholders due to the amendment of procedure commencement points.

### 1.4 Current Instrument Flight Procedures and Infrastructure

- 1.4.1 Hawarden Airport is currently equipped with;
- A Medium Frequency (MF) Non-Directional Locator Beacon (NDB);
  - Category 1 Instrument Landing System (ILS) to runways 22 and 04;
  - Distance Measuring Equipment (DME) frequency paired to the ILS and zero ranged to respective thresholds;
  - Easat radar – providing Surveillance Radar Approach (SRA).
- 1.4.2 The NDB/ILS/DME facilities support both ILS/DME and Localiser LLZ/DME Instrument Approach Procedures (IAPs) to the final approach track on each runway.
- 1.4.3 Whilst there is no plan to remove any of the current conventional airport based Nav aids from service, consideration of GNSS approaches has identified the following advantages;
- Resilience for Navaid failure;
  - Enhanced flying training opportunities;
  - Removal of reliance on NDB availability (single point failure).

1.4.4 There are no connected Standard Arrival Routes (STARS) associated with the ground based Navaids at Hawarden. As such, arriving aircraft are routed in accordance with standard radar vectored patterns to the conventional IFPs, or by using their own navigation to position on the same. Accordingly, this gives a spread of the tracks aircraft fly on approach within the constraints of the local airspace. Aircraft interpreted ILS and NDB based approaches are infrequently flown primarily for training purposes. Based upon the prevailing winds and traffic Runway 22 is used 70% of the time and Runway 04 30%.

## 2 The Demand and Options for GNSS Approaches

2.1 Based upon an operational desirability identified by ATI and the benefits to the Airport a decision has been made to propose the implementation of GNSS approaches to both runway 22 and 04 at Hawarden Airport. As a result of this Airbus engaged a consultant, Cyrrus Ltd., to identify suitable design proposals, design the approaches and commence related safety assurance work. This work was conducted concurrently with the review of the conventional IFPs.

2.2 In assessing the most suitable GNSS approach Cyrrus Ltd. held a stakeholder meeting to discuss operational requirements, airspace and aircraft limitations. ICAO Doc 9613 Performance Based Navigation (PBN) Manual and ICAO state Letter SP 65/4-10/53 provide descriptions of the types of RNAV (GNSS) Instrument Approach Procedures (IAPs) classified as Required Navigation Performance approach. Essentially these are:

LNAV – A Non-Precision Approach (NPA) with lateral navigation guidance provided by Global Positioning System (GPS) and an Aircraft Based Augmentation System (ABAS) in the form of Receiver Autonomous Integrity Monitoring (RAIM).

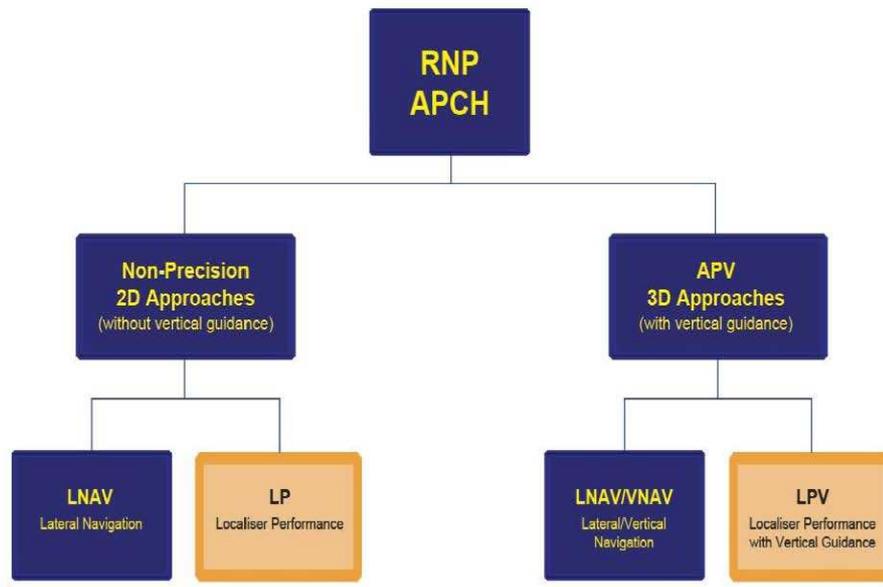
LP (Localiser Performance) – A NPA with lateral navigation guidance provided by GPS and a Satellite Based Augmentation System (SBAS).

LNAV/VNAV - A GNSS procedure where lateral navigation guidance is provided by GPS and Aircraft Based Augmentation System (ABAS) in the same way as for LNAV. Vertical guidance is provided by a Barometric Altimeter and is commonly known as “APV Baro VNAV.”

LPV – An APV where both lateral and vertical guidance are provided by GPS and SBAS.

- *Note –Fig 4.1, provides a diagrammatic representation of the procedure hierarchy with the augmented procedures (LP and LPV) shaded in a buff colour.*

Fig 1



2.3 Following the initial stakeholder consultation, the IAPs selected for implementation at Hawarden are LNAV, LNAV/VNAV and LPV.

2.4 Whilst full transition to the GNSS procedure (via a STAR or similar) is desirable, the complexity of the surrounding airspace and operational procedures associated with Manchester and Liverpool airports currently make this very difficult to achieve.

### 3 Conventional IFP Review

3.1 The CAA requires all EASA certificated aerodromes to review their IFPs on a 5 yearly basis. This review involves assessments to ensure that the design of the procedures is in compliance with ICAO design requirements, particularly with regard to terrain and obstacle clearances

3.2 The most recent review of the Hawarden conventional IFPs was conducted in July 2016. This review identified the following changes be made in order for the IFPs to be compliant with ICAO design requirements:

- a) The holding pattern (HAW) requires either a reduction in the maximum holding speed to 185kts or raising the minimum holding altitude to 3000ft amsl.
- b) The amendment of all runway 22 base turns to D8.2 (currently D7.5).

3.3 Copies of the proposed changes to the Runway 22 conventional IFPs affected are reproduced at Appendix D.

### 4 Hawarden ATC

4.1 Serco (as the ANSP) provides Air Traffic Control Services at Hawarden Airport. A service from Aerodrome Control (ADI) is provided to aircraft and vehicles on the ground and to aircraft in the immediate vicinity of the airport. A service from Approach Radar Control (APS) is provided to aircraft operating up to 40nm from the airport.

- 4.2 Operational hours of the airport are detailed in the United Kingdom Aeronautical Information Publication (UKAIP). At present the weekday operational hours are 0630 to 2100 local time with the option for additional Beluga operations until midnight. At weekends and public holidays the operational hours are predominantly 0830 to 1900 local time<sup>1</sup>.
- 4.3 As Hawarden Airport lies outside Controlled Airspace<sup>2</sup> there are no Standard Instrument Departures (SIDs) published. Instead, Standard Outbound Clearances<sup>3</sup> (SOCs) are utilised and published in the UKAIP to affect a safe and efficient entry into the airways structure. The Standard arrival routes from the airways structure route aircraft to a holding fix located inside controlled Airspace (CAS). From these points aircraft are radar vectored to the conventional IFPs or radar monitored whilst carrying out the pilot interpreted IFPs.
- 4.4 Control of inbound airways traffic to Hawarden Airport is transferred to Hawarden ATC within the protection of Controlled Airspace. However, all of the 04 final approach path and several critical areas of the 22 final approach are located in Uncontrolled Airspace. A significant proportion of the 22 IFPs is located within the Liverpool Control Zone which is accessed in accordance with letters of agreement between the two units and via controller to controller coordination.

## 5 Approach Procedure Design Objectives

- 5.1 The Approach procedures must be suitable for category A, B, C & D aircraft.
- 5.2 GNSS procedures must be published to accommodate SBAS and ABAS equipped aircraft.

## 6 Operational Requirements to be Met

- 6.1 Hawarden ATC identified several key operational requirements that must be met by the new and revised procedures:
- Provision of GNSS approaches suitable for use by AT1 and as many other current aircraft operators as possible.
  - Provision of a GNSS based holding fix to address the single point failure of the NDB based hold.
  - Minimal (ideally nil) negative impact on current airspace users caused by adoption of the proposed GNSS procedures and amended IFPs.
  - Minimal (ideally nil) negative impact on adjacent airports and ATC units caused by adoption of the proposed GNSS procedures and amended IFPs.
  - Minimal (ideally nil) negative impact on communities located beneath the typical flight track of the proposed GNSS procedures and amended IFPs, as a result of their adoption.

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<sup>1</sup> Airbus operations may take place between 0630 and 2100 local times.

<sup>2</sup> In 2017 Hawarden Airport established a Radio Mandatory Zone in the vicinity of the airport.

<sup>3</sup> Standard Outbound Clearances are equivalent to Planned Departure Routes.

## 7 Design Proposal for Hawarden GNSS procedures

- 7.1 This section details the airspace configuration being proposed.
- 7.2 No configuration changes to the airspace or procedures proposed as a result of focus group results or stakeholder feedback was proposed.
- 7.3 Diagrams of the configuration of the proposed procedures is shown in diagram 1 & 2 below.

Diagram 1

Proposed Hawarden GNSS Approach – Runway 04

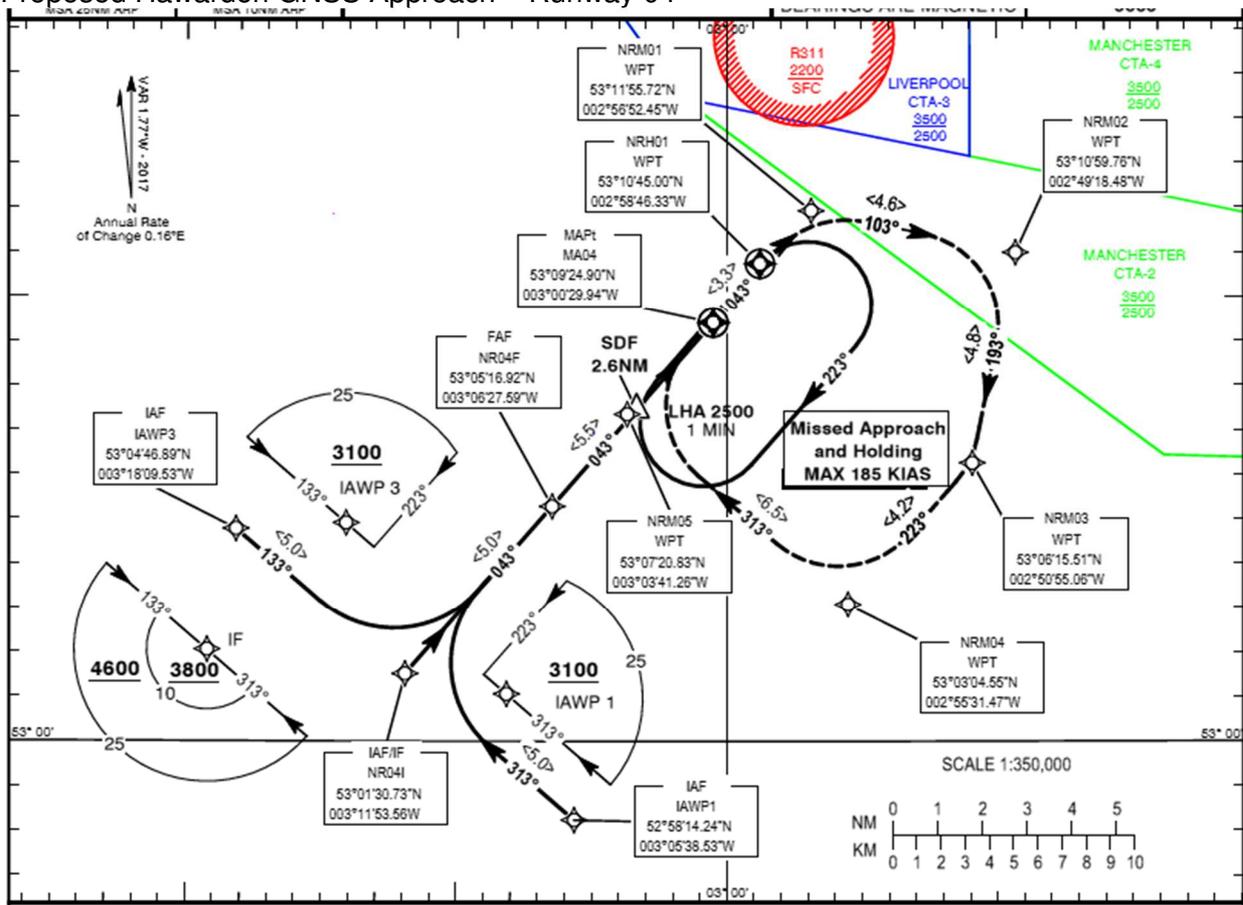
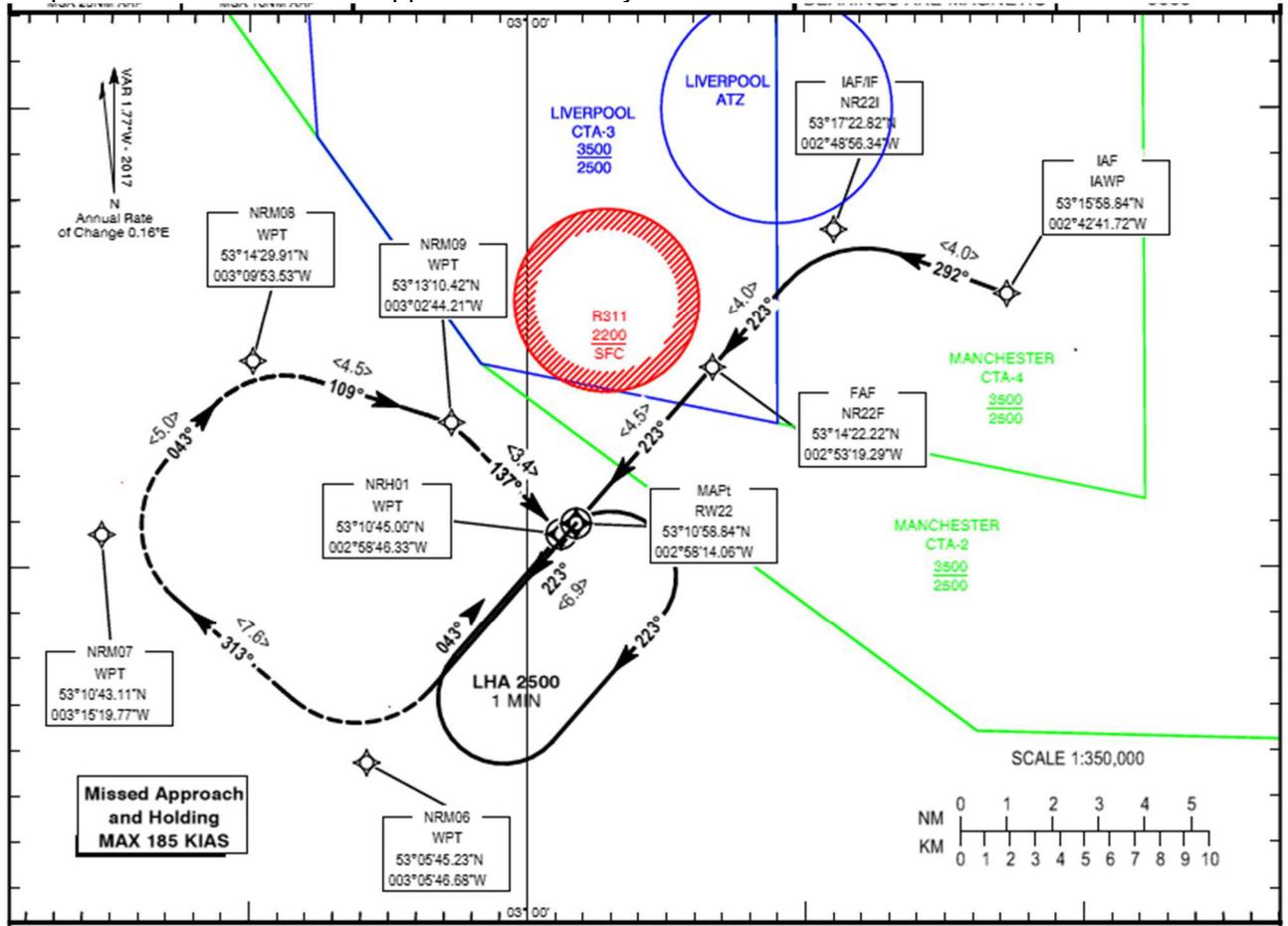


Diagram 2

Proposed Hawarden GNSS Approach – Runway 22



## 8 Operation of the Proposed GNSS procedures

- 8.1 Whilst the desire for the GNSS approaches has been established and the requirement for the amendment to the conventional IFPs, it is recognised, that following consultation an appropriate period of promulgation of the procedures needs to be undertaken both nationally and locally.
- 8.2 Implementation and adoption of the revised procedures (and charts) are subject to the UKAIP AIRAC update cycle.
- 8.3 It is expected that the letters of agreements for held with Liverpool ATC and North Wales Gliding Club may require amendment to make specific reference to the GNSS procedures. This will be actioned at least 8 week prior to implementation of the new procedures.
- 8.4 With due regard to these factors, the proposed date of adoption of the GNSS procedures and revised conventional IFPs is 11<sup>th</sup> October 2018.
- 8.5 Following completion of the consultation, no adaptations are required to the proposed GNSS procedures or amended conventional IFPs. As such the Safety Case for the project will be completed. This safety case will identify key actions that are required to be carried out either as part of the safety assurance programme or as part of transition and may include (but not be limited to):
- (i) Simulator trials of the GNSS procedures.
  - (ii) Flight trials of the GNSS procedures.
  - (iii) Coding of the procedures for use by flight management computers and flight management/planning software.
  - (iv) ATCO transition plan, including theory and simulator training.
  - (v) Amendment of local documentation.

## 9 Impact on Airspace Users

### 9.1 Integration of VFR and other airspace activity

9.1.1 There will be no change to the integration of VFR and other airspace activities as the proposed new GNSS and amended conventional IFPs will be accommodated in the same manner as the current conventional IFPs.

### 9.2 A300-600 Super Transporter operations (ATI)

9.2.1 There is no perceived adverse impact on A300-600 ST operations by the introduction of the GNSS procedures.

9.2.2 ATI crews will need to conduct some level of training with regard to the adoption of the GNSS procedures either using flight simulators or as part of operational flights. This will be addressed by the organisations internal training system.

9.2.3 The proposed amendments to the conventional IFPs include a proposal to reduce the maximum speed at the HAW NDB hold to 185kts (from 210kts). This will require the A3ST to operate with slats and or flaps deployed (a different configuration to currently the case). Whilst this is not ideal, from an aircraft efficiency point of view, the aircraft can be operated in this configuration as is the case at the majority of other UK airports. It must be further noted that although holding at the HAW is an option, it is rarely operationally employed.

### 9.3 Airline Operators

9.3.1 Eastern Airways and ATI are the only airlines currently operating at Hawarden Airport. Both of these airlines operate on behalf of Airbus.

9.3.2 There is no perceived adverse impact on Eastern Airways operations by the introduction of the GNSS procedures.

9.3.3 Eastern Airways crews will need to conduct some level of training with regard to the adoption of the GNSS procedures either using flight simulators or as part of operational flights. This will be addressed by the organisations training system.

### 9.4 Other Hawarden Airport operators

9.4.1 There is no perceived adverse impact on other Hawarden Airport operators by the introduction of the GNSS procedures.

9.4.2 Should they wish to utilise the GNSS approach procedure crews will need to conduct some level of training with regard to the adoption of the GNSS procedures either using flight simulators or as part of operational flights. This will be addressed by the organisations or individuals training system.

9.4.3 Notwithstanding 9.4.2 above, aircraft wishing to conduct and instrument approach to Hawarden that are not appropriately qualified or otherwise do not wish to use the GNSS approach procedures may still conduct approaches either visually or using the conventional IFPs.

## 9.5 Adjacent Airports

- 9.5.1 The only airport that will be affected by the amended and new procedures is Liverpool Airport.
- 9.5.2 As the design of the amended and new procedures closely reflect the current conventional IFPs there is no change to the impact on the interaction with the Liverpool Airport.
- 9.5.3 During the consultation a concern was raised by Liverpool Airport regarding the potential disruption that could be caused to their air traffic as a result in a significant use of the full GNSS procedure to runway 22 at Hawarden Airport. Meetings and discussions were held to confirm that use of the full GNSS procedure to runway 22 (ie allowing an aircraft to navigate itself via the IAF IAWP) would be treated in the same manner as use of the current NDB based approaches.
- 9.5.4 These procedures are subject to a letter of agreement between the two units (which will be amended) and additional the subject of ATCO to ATCO coordination. Use of the amended conventional IFPs will be treated as at present. Radar vectored approaches to the IAF/IF or FAF on the GNSS approach to runway 22 would be treated as the current radar vectored ILS. All of this would be in accordance with an amended letter of agreement.
- 9.5.5 A daily amount of 7 uses of the full GNSS procedure for runway 22 at Hawarden was agreed which would be used as a trigger to review the letter of agreement between the two units and associated coordination procedures (a copy of this agreement is reproduced at appendix E)
- 9.5.6 The proposed GNSS approach procedure to runway 04 at Hawarden has no impact on Liverpool Airport.

## 9.6 Area Control Centre

- 9.6.1 As the design of the amended and new procedures closely reflect the current conventional IFPs there is no impact on the interaction with the area control centre.
- 9.6.2 A working group is currently examining the options for re-designing the airways, Terminal Control Area (TMA) and CTRs around the Liverpool, Manchester and Leeds area. The focus of the working group is aimed at re-organising the existing airspace structure to incorporate RNAV, continuous descent arrivals (CDA) and continuous climb profiles (CCP). The changes to the Manchester and Liverpool approach procedures are being designed not to have an impact on the existing Hawarden IFPs. As a result, these changes will not have an impact on the proposed Hawarden GNSS procedures or the amendments to the conventional IFPs.

## 9.7 Gliders

- 9.7.1 A current Letter of Agreement is in force with Llantysilio which will remain in place. It is expected that this letter will not materially change as the effects on the gliding site will be the same as at present. The letter may need to be re-worded to make specific reference to the GNSS procedures.

## 9.8 Miscellaneous airspace activity

9.8.1 The area to the South of Hawarden Airport, over the Cheshire Plain, is widely used by GA aircraft from Liverpool, Sleaford and others for general handling exercises. As the amended conventional IFPs and the proposed GNSS approaches are similar to the existing, there will be no impact to the miscellaneous activity taking place in the areas around Hawarden.

## 9.9 Choke points

9.9.1 The introduction of the revised conventional IFPs and new GNSS approaches will not generate any choke points as there will be no overall change to traffic patterns or associated airspace.

## 10 Environmental Considerations

10.1 The CAA requires that sponsors of airspace change take due regard for the need to reduce, control and mitigate as far as possible the environmental impacts of aircraft operations, including disturbance caused to the general public arising from aircraft noise and emissions from aircraft engines.

10.2 The proposal for the introduction of GNSS approaches has been designed to operate with no overall change to the existing aircraft routings or noise abatement procedures.

10.3 As such there will be no negative environmental impact but a positive change is envisaged by reductions in unnecessary fuel burn achieved by aircraft optimised configuration for a defined descent profile.

10.4 The environmental considerations are explored in greater detail in the Environmental Impact Assessment (annex B to this document).

## 11 The Consultation Process

11.1 Prior to the formal CAP725 process Hawarden Airport conducted early stakeholder engagement in the form of a meeting held on 2<sup>nd</sup> February 2016. This meeting was to discuss operational requirements and impacts for aircraft operators and adjacent aerodromes/ATC units. The meeting captured dependencies and limitations and also outlined the process being followed and some initial design concept.

11.2 This process was subsequently formalized by holding a framework briefing with SARG in June 2017. A formal consultation process was run from 9<sup>th</sup> November 2017 to 9<sup>th</sup> February 2018, primarily in electronic format. During this period additional stakeholder meetings were held with key organizations which had specific issues they wished to resolve.

11.3 On the conclusion of consultation a post consultation report was produced, submitted to SARG and made available on the Hawarden Airport website.

11.4 Subsequent to this an Environmental Impact Assessment was produced on 19<sup>th</sup> March 2018.

## 12 Safety Management

- 12.1 The hazards associated with this proposal have been analysed and identified as follows;
- a) Loss of aircraft separation – due to pilot or ATCO unfamiliarity with new/revised procedures.
  - b) Loss of aircraft separation – due to adjacent ATC unit or airport interaction not being considered amended.
  - c) Airspace infringements – due to unexpected aircraft performance using new/revised procedures.
- 12.2 As part of the Serco Aviation Management Plan mitigations have been identified to address hazards at 12.1, above as follows;
- a) Publication of the new procedure and local promotion to the aviation community.
  - b) Transition training of ATC staff.
- 12.3 All of these changes will be managed in accordance with change management processes established as part of the Serco Aviation Management Plan and documented separately.

## 13 Airspace and Infrastructure Requirements

- 13.1 There is no identified supporting airspace infrastructure required to enable this ACP as there are no changes to established IFR or VFR routes.

## 14 Supporting Maps, Charts and Diagrams

- 14.1 Supporting Maps and Charts have been included throughout the body of this document at pertinent junctures. Additional diagrams are reproduced at Appendix [A](#) for clarity.

## 15 Summary

### 15.1 “Do nothing”

15.1.1 In respect of the conventional IFPs; if no change were made the instrument approached would be non-compliant with the design requirements. This means that separation from obstacles would be less than the required minima. As a result suspension of the procedures would be a possibility.

15.1.2 In respect of the GNSS IFPs; if no change were made aircraft would not have the option to use the procedure, whilst the conventional IFPs remain available for use this impact is somewhat mitigated; however, the key operational requirement of ATI could not be met. A lack of adoption would also mean ignoring the opportunity for adoption of increased resilience at Hawarden Airport

### 15.2 Amend the conventional IFPs

15.2.1 Is the only viable option to maintaining the conventional IFPs.

### 15.3 Develop GNSS arrival and departure procedures which are 'connected' to the airways structure

15.3.1 Whilst this would be an ideal theoretical solution. There are several issues which preclude this as a viable option.

- (i) Hawarden Airport is located outside controlled airspace and therefore 'connected STARs and SIDs' could not be adhered to.
- (ii) Complexity and limitation of the surrounding and adjacent airspace.

### 15.4 Develop GNSS procedures (non-connected)

15.4.1 This option would achieve the operational requirement of ATI and would also provide the additional resilience desired by Hawarden Airport. From this high level option it was then necessary to define what type or types of GNSS should be developed.

15.4.2 The ATI requirement is for a full LPV approach which is commensurate with the equipment of the aircraft. Accordingly this design needs to be developed. However, if no other designs were developed, lesser equipped aircraft or pilots/operators without relevant approvals could not utilise these approaches.

## 16 Conclusions

16.1.1 The development of the proposed Airspace change has and will continue to be carried out in a fair and balanced manner with respect to all affected individuals and organisations.

16.1.2 Hawarden Airport believes that there are no quantifiable adverse environmental impacts generated as a result of the proposed change. Conversely, the changes will increase the adherence to aircraft optimal routing, climb and descent profiles, resulting in lower fuel usage.

## 17 Next Steps

17.1 The consultation has been conducted in accordance with CAP725 and has enabled Hawarden Airport to obtain or confirm the views of stakeholders regarding the proposed changes, before the formal submission of a proposal to the CAA. This process also allows the CAA to fulfil its obligation under the Transport Act 2000 and Ministerial Directions.

17.2 The consultation ended on 9<sup>th</sup> February 2018.

17.3 A total of 147 aviation and potentially affected organisations, representatives or individuals were consulted. The aviation consultees included local airspace user organisations, national representative bodies and Air Traffic Management organisations. Responses were received from 11% of the consultees. A higher response would have been desirable however 2 communications were sent in January and February 2018 to remind consultees of the closure date for the consultation. The second of these communication included email voting buttons in an attempt to elicit a higher response.

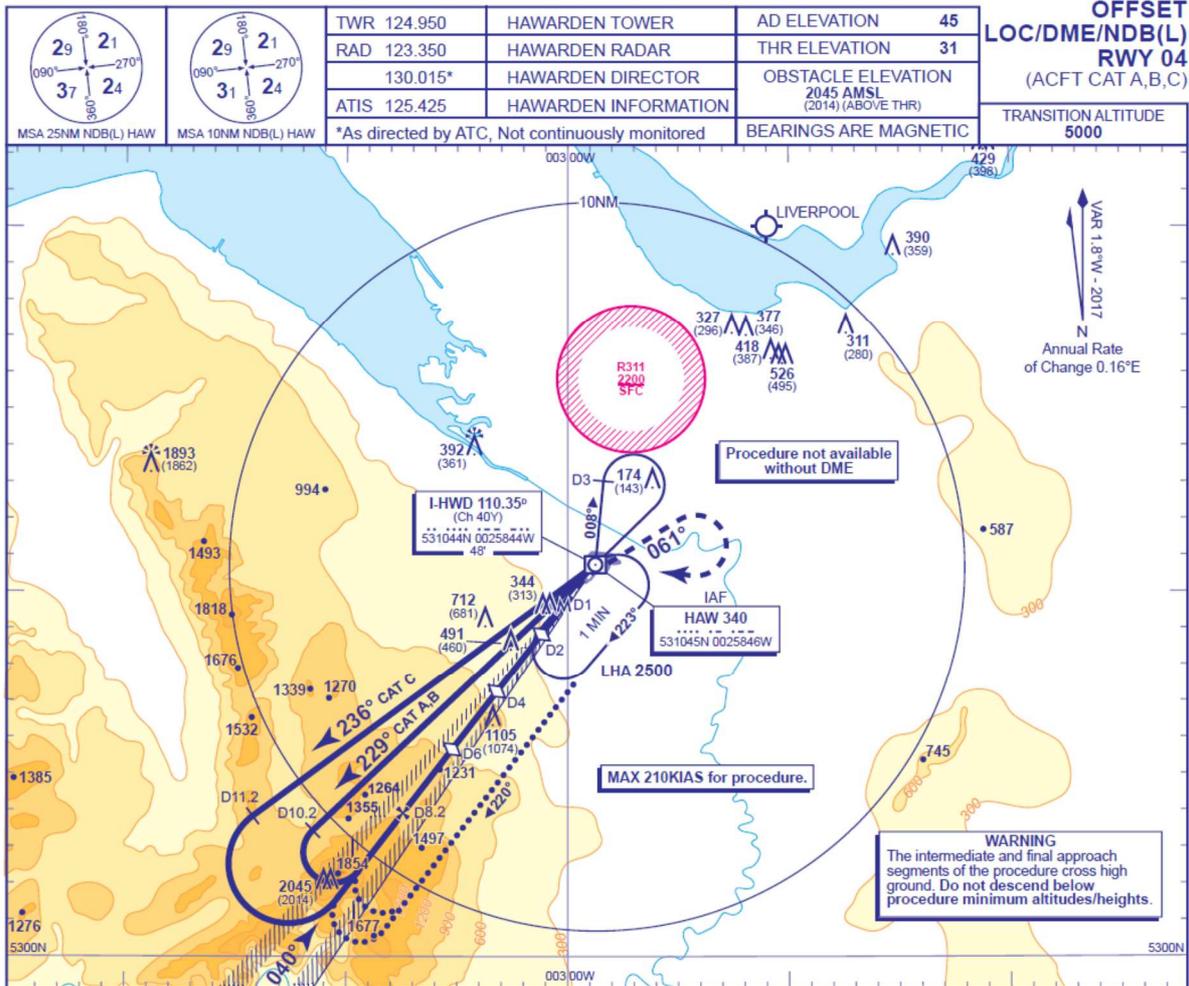
17.4 All responses to this consultation were acknowledged. Relevant respondents were contacted for further clarification on any points required.

- 17.5 Following discussion with stakeholders, Hawarden Airport has engaged with consultees who believed they may be adversely affected by the proposed changes to establish mitigations or assurances that address these concerns.
- 17.6 All responses have been collated and analysed leading to the production of a post consultation (Annex A to this document) which will be circulated to all consultees via email and posted on the website.
- 17.7 As the consultation was focussed on eliciting objections and that the engagement and hastener communications clarified that no response would be read as no objection, a 'no-response' is considered as usable.
- 17.8 All 4 respondents who were non-supportive of the proposal also supplied comments and or points for clarification. This lead to further engagement in order to address some of the issues raised.
- 17.9 Hawarden Airport believes that the case for amending the conventional IFPs and introducing GNSS approach procedures at Hawarden Airport is strong. As such Hawarden Airport is requesting that the CAA permit the amendment of the conventional IFPs and introduction of GNSS approaches to Hawarden Airport
- 17.10 In accordance with its regulatory process the CAA will review the proposal before making a regulatory decision, which will be published by the Director of Safety and Airspace Regulation. This review may take up to 16 weeks.
- 17.11 Subject to Regulatory Approval of the ACP, the CAA in conjunction with Hawarden Airport will promulgate the relevant changes in the UK AIP. This will be subject to the standard AIRAC cycle and will take around 17 weeks.



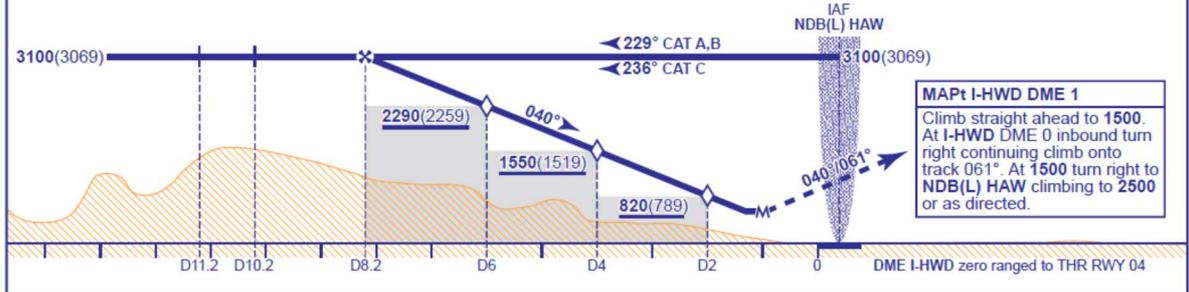
INSTRUMENT APPROACH CHART - ICAO

**HAWARDEN  
OFFSET  
LOC/DME/NDB(L)  
RWY 04  
(ACFT CAT A,B,C)**



RECOMMENDED PROFILE Gradient 6.1%, 370FT/NM

DME I-HWD	8	7	6 (SDF)	5	4 (SDF)	3	2 (SDF)
ALT(HGT)	3030(2999)	2660(2629)	2290(2259)	1920(1889)	1550(1519)	1190(1159)	820(789)



Aircraft Category	A	B	C	Rate of descent	G/S KT	160	140	120	100	80
	OCA (OCH)	Procedure	570(539)		570(539)	570(539)	FT/MIN	980	860	740
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)							
	East of RWY 04/22	700(655)	800(755)	1500(1455)						

**ALTERNATIVE PROCEDURE**  
Overhead NDB(L) HAW at 3100(3069) turn right and continue the outbound leg of the hold then turn left onto track 220°. At I-HWD DME 10.2 (CAT A,B) or I-HWD DME 11.2 (CAT C) commence right turn to establish on the localizer then continue as for basic procedure. Remain within I-HWD DME 15.

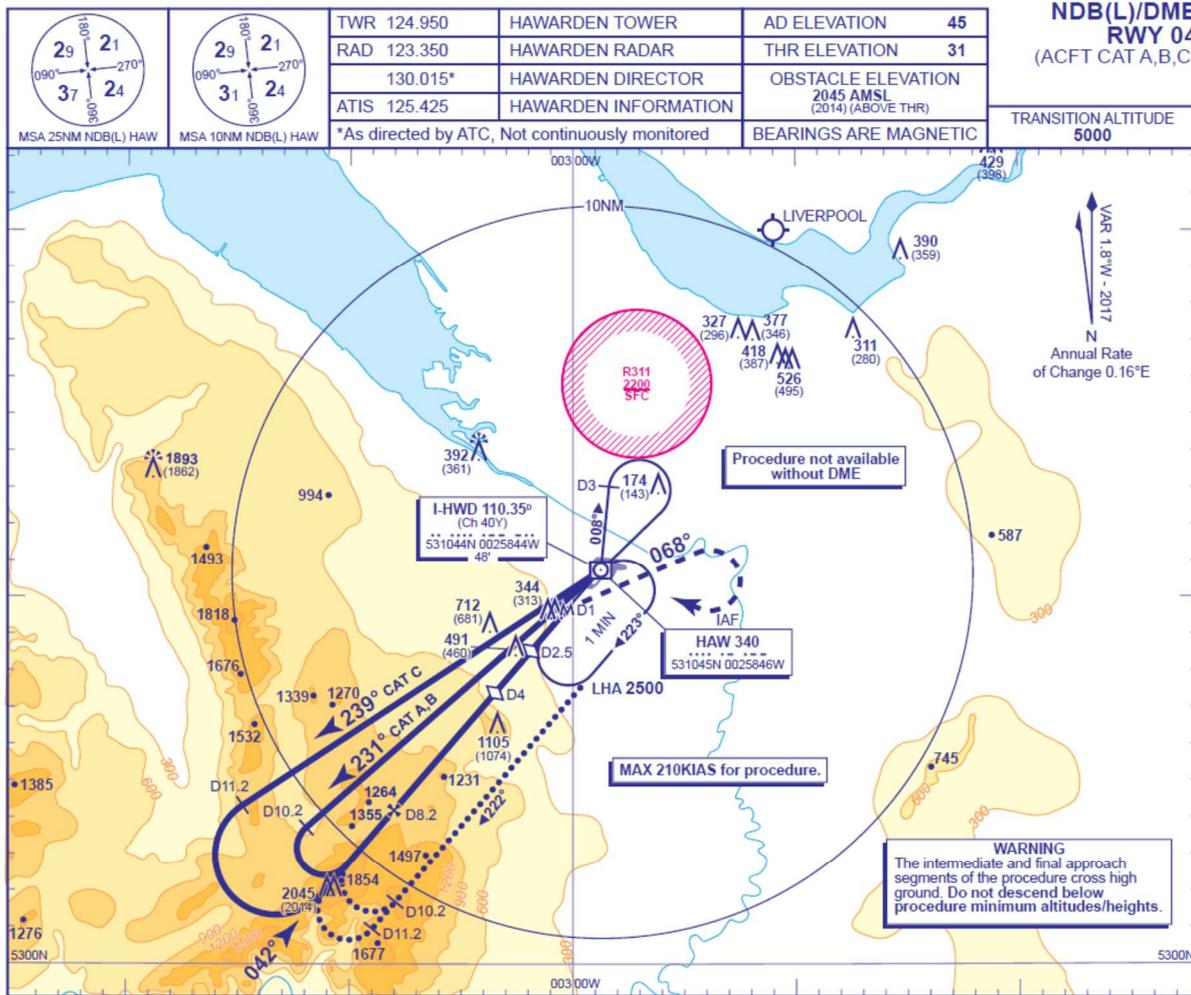
**NOTE 1** LOC is offset 2.6° right of RWY 04 C/L and intercepts the RWY C/L 1NM from the THR.  
**NOTE 2** Reversal basturn from NDB(L) HAW outbound on QDR 008° to I-HWD DME 3 (1 MIN).

CHANGE (6/17): MAG VAR. MAG TRACKS. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.

AERO INFO DATE 15 MAR 17

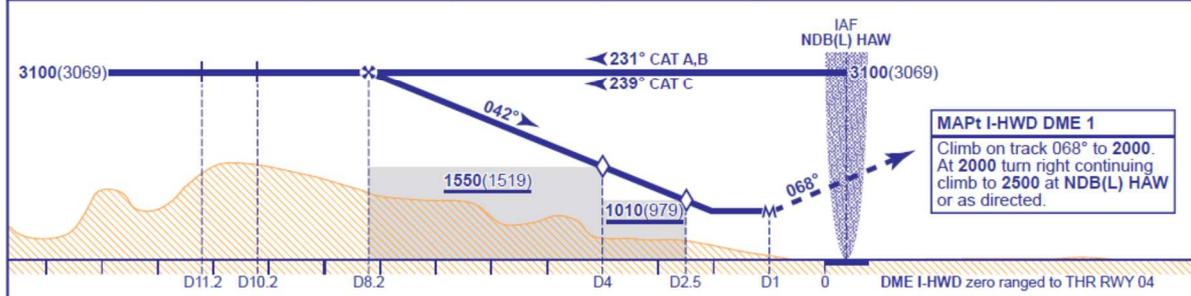
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN  
NDB(L)/DME  
RWY 04  
(ACFT CAT A,B,C)**



RECOMMENDED PROFILE Gradient 6.1%, 370FT/NM

DME I-HWD	8	7	6	5	4 (SDF)	3	2.5 (SDF)
ALT(HGT)	3030(2999)	2660(2629)	2290(2259)	1920(1889)	1550(1519)	1180(1149)	1010(979)



Aircraft Category	A	B	C
OCA (OCH) Procedure	830(799)	830(799)	830(799)
VM(C)OCA (OCH AAL) Total Area	800(755)	900(855)	
VM(C)OCA (OCH AAL) East of RWY 04/22	700(655)	800(755)	1500(1455)

Rate of descent	G/S KT	160	140	120	100	80
	FT/MIN	980	860	740	610	490

**ALTERNATIVE PROCEDURE**  
Overhead NDB(L) HAW at 3100(3069) turn right and continue outbound on track 222°. At I-HWD DME 10.2 (CAT A,B) or I-HWD DME 11.2 (CAT C) commence right turn to establish on the extended FAT. When established continue as for basic procedure. Remain within I-HWD DME 15.

**NOTE** Reversal baseturn from NDB(L) HAW outbound on QDR 008° to I-HWD DME 3 (1 MIN).

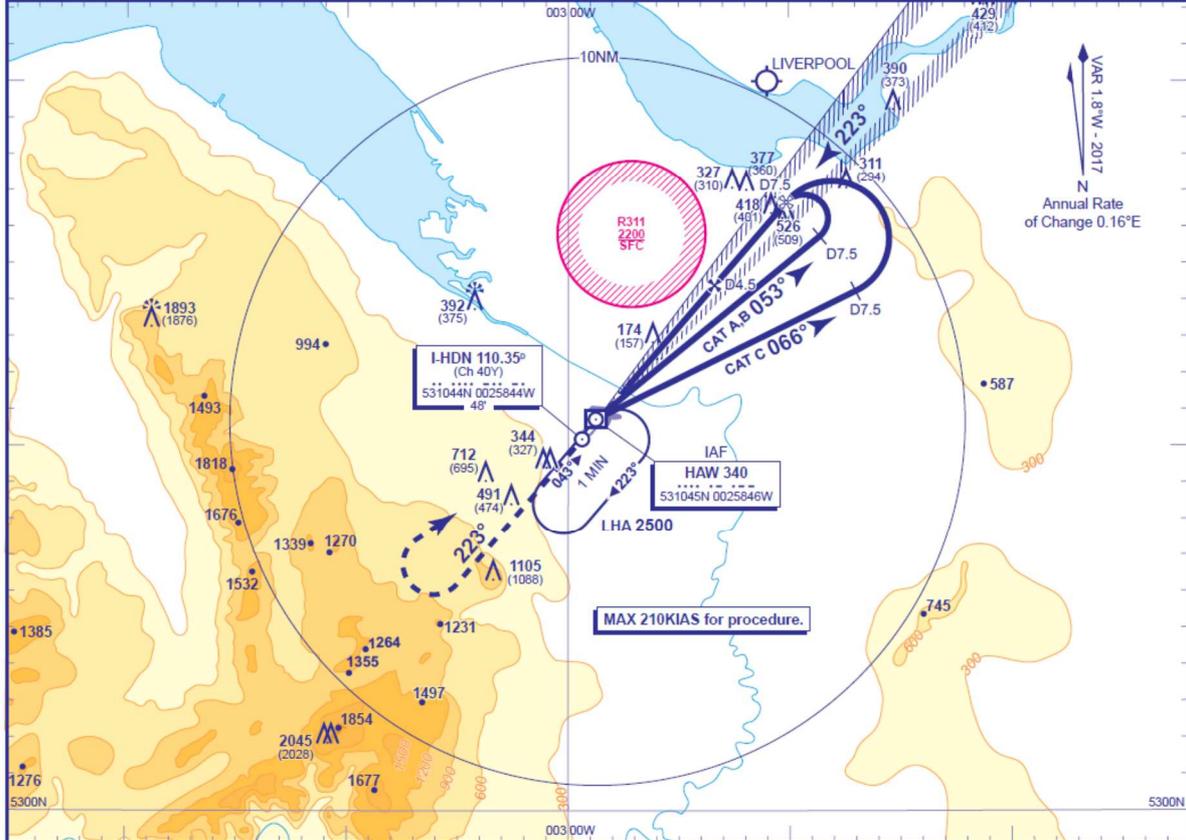
CHANGE (6/17): MAG VAR. MAG TRACKS. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.

AERO INFO DATE 16 MAR 17

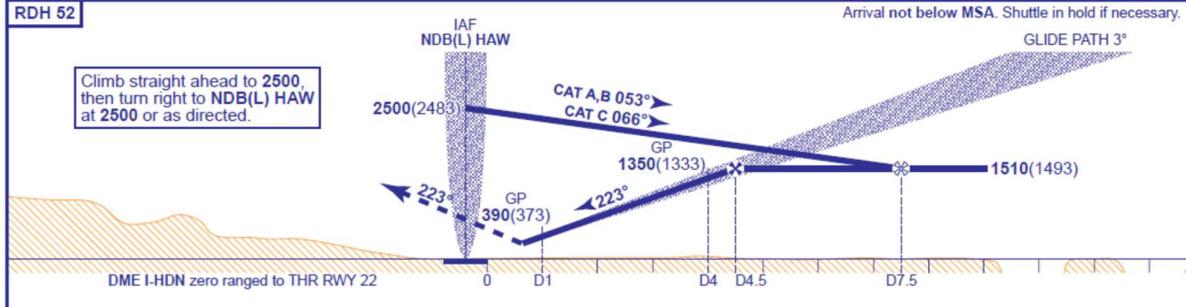
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN  
ILS/DME/NDB(L)  
RWY 22  
(ACFT CAT A,B,C)**

		TWR 124.950 RAD 123.350 130.015* ATIS 125.425	HAWARDEN TOWER HAWARDEN RADAR HAWARDEN DIRECTOR HAWARDEN INFORMATION	AD ELEVATION 45 THR ELEVATION 17 OBSTACLE ELEVATION 2045 AMSL (2028) (ABOVE THR)	BEARINGS ARE MAGNETIC	TRANSITION ALTITUDE 5000
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RECOMMENDED PROFILE GLIDE PATH 3°, 320FT/NM				
DME I-HDN	4	3	2	1
ALT(HGT)	1350(1333)	1030(1013)	710(693)	390(373)



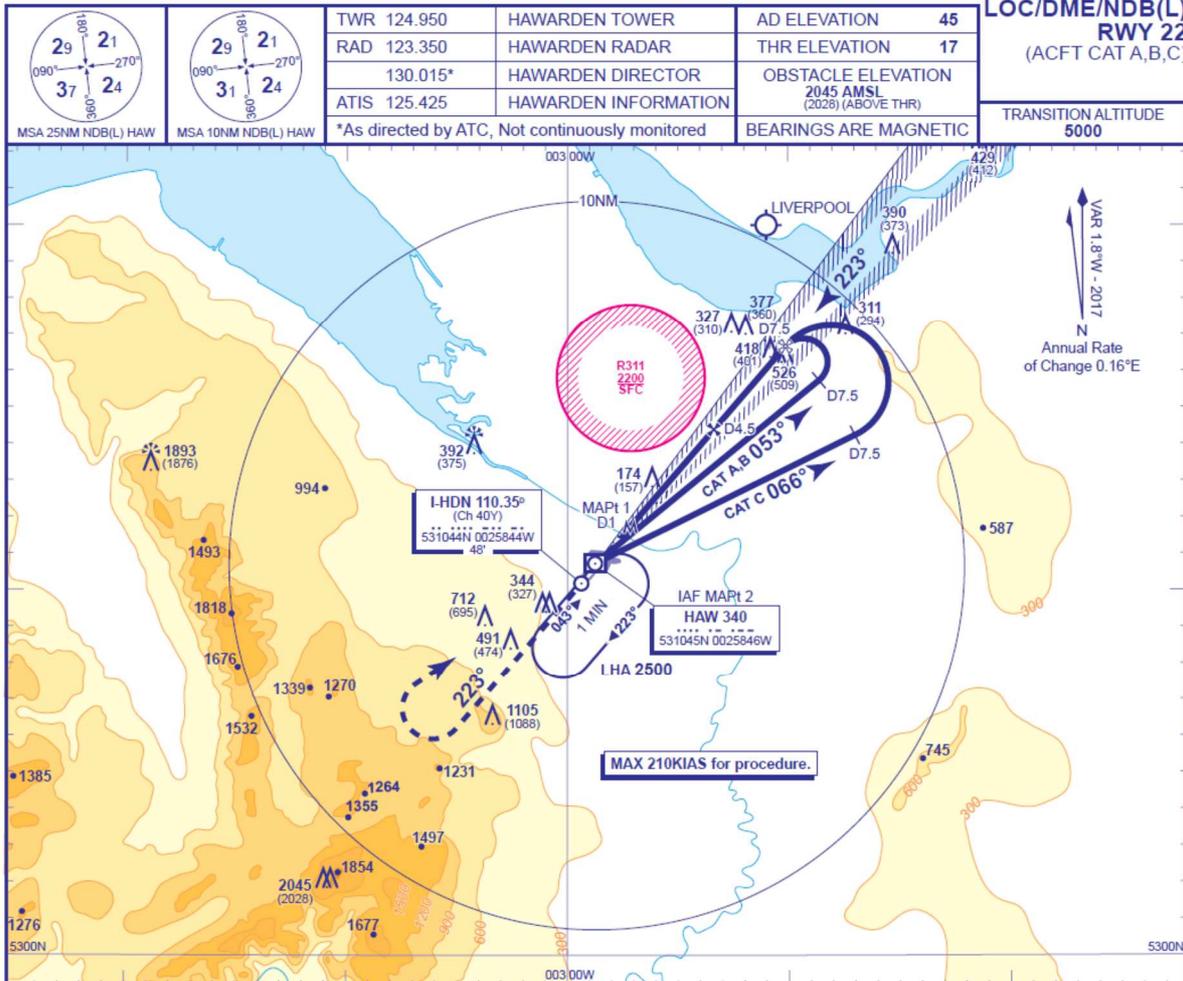
Aircraft Category		A	B	C	Rate of descent	G/S KT	160	140	120	100	80
		2.5% Climb	380(363)	390(373)		400(383)	FT/MIN	850	750	640	530
OCA (OCH)	3% Climb	270(253)	280(263)	290(273)							
	Total Area	800(755)	900(855)								
VM(C)OCA (OCH AAL)	East of RWY 04/22	700(655)	800(755)	1500(1455)							

**AIRCRAFT UNABLE TO RECEIVE DME I-HDN**  
Advise ATC. Subject to ATC approval, radar ranges will be provided at 7.5NM outbound and at 4.5NM inbound.

CHANGE (6/17): MAG VAR. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.  
AERO INFO DATE 14 MAR 17

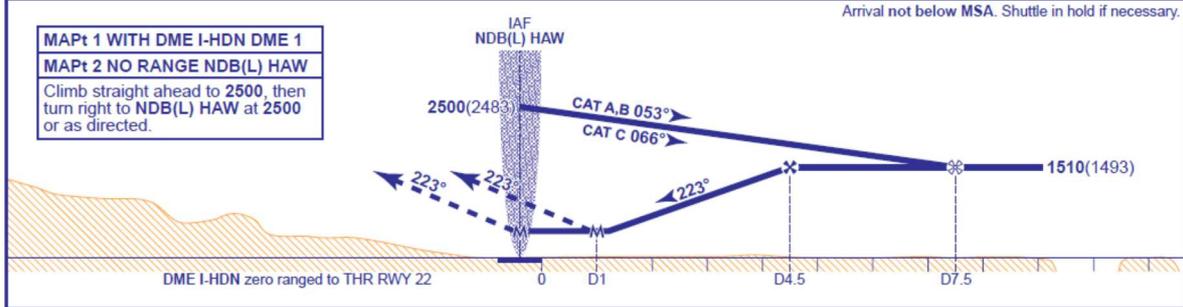
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN**  
**LOC/DME/NDB(L)**  
**RWY 22**  
 (ACFT CAT A,B,C)



**RECOMMENDED PROFILE** Gradient 5.2%, 320FT/NM

DME I-HDN	4	3	2
ALT(HGT)	1350(1333)	1030(1013)	710(693)



Aircraft Category		A	B	C	Rate of descent	G/S KT	160	140	120	100	80
OCA (OCH)	No DME radar range only	2.5% Climb	680(663)	680(663)	680(663)	FT/MIN	860	750	640	530	430
		3% Climb	560(543)	560(543)	560(543)						
		4% Climb	450(433)	450(433)	450(433)						
	With DME 2.5% Climb	450(433)	450(433)	450(433)							
	No DME or radar range	830(813)	830(813)	830(813)							
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)								
	East of RWY 04/22	700(655)	800(755)	1500(1455)							

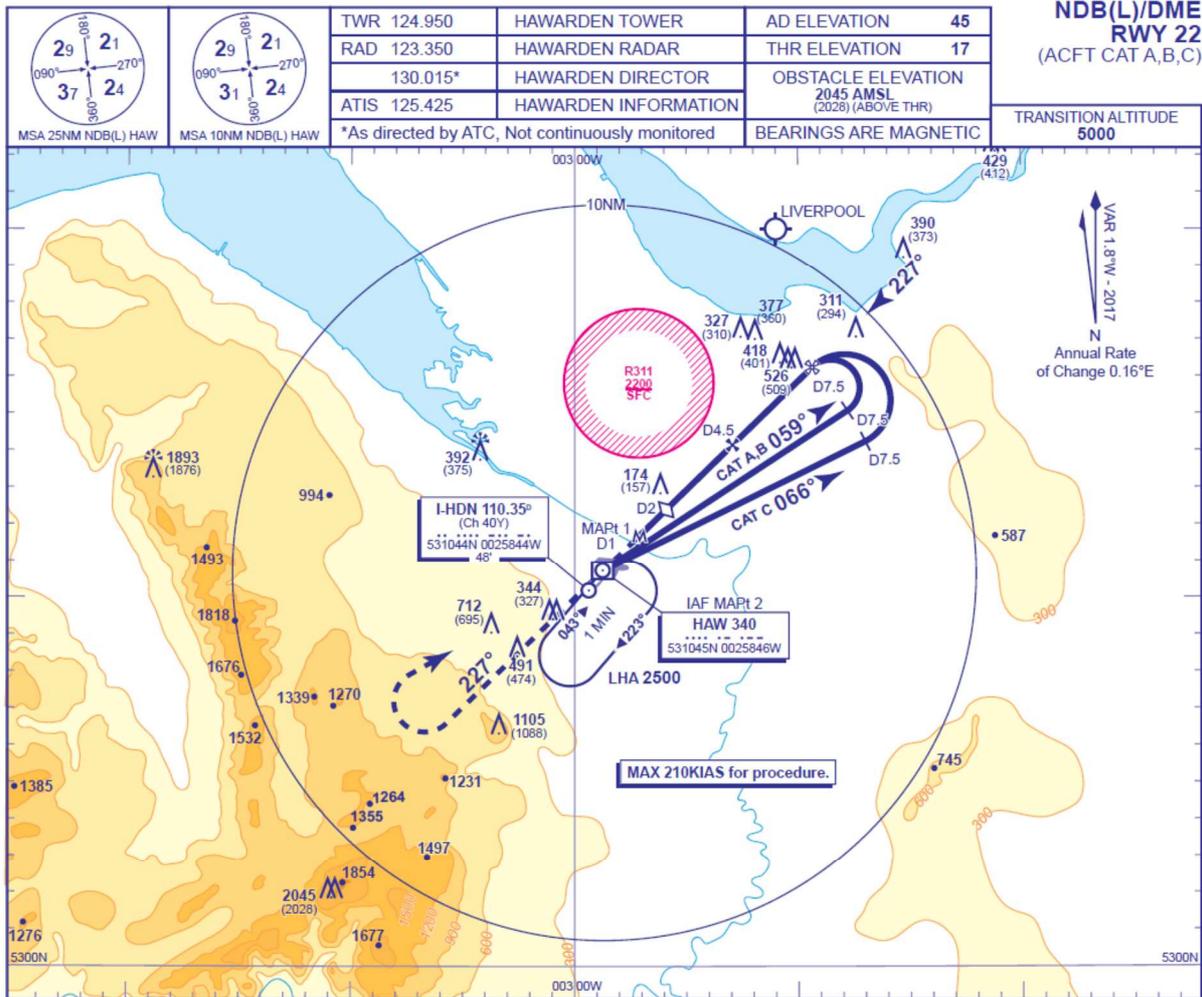
**AIRCRAFT UNABLE TO RECEIVE RANGE INFORMATION**  
 CAT A fly outbound for 3 MIN, CAT B 2.5 MIN and CAT C 2 MIN.

CHANGE (6/17): MAG VAR. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.

AERO INFO DATE 14 MAR 17

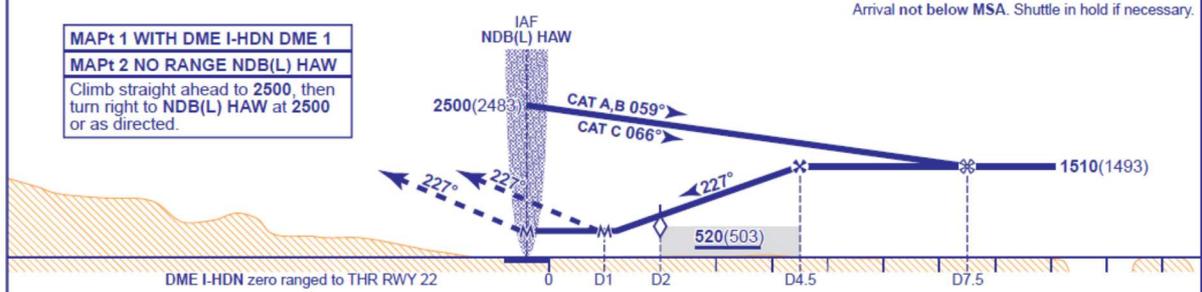
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN  
NDB(L)/DME  
RWY 22  
(ACFT CAT A,B,C)**



RECOMMENDED PROFILE Gradient 5.2%, 320FT/NM

DME I-HDN	4	3	2 (SDF)
ALT(HGT)	1350(1333)	1030(1013)	710(693)



Aircraft Category	A	B	C	Rate of descent	G/S KT	160	140	120	100	80
OCA (OCH)	With DME 2.5% Climb	500(483)	500(483)	500(483)	FT/MIN	860	750	640	530	430
	With DME 3% Climb	450(433)	450(433)	450(433)						
	Radar range only	640(623)	640(623)	640(623)						
	No DME or radar range	830(813)	830(813)	830(813)						
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)							
	East of RWY 04/22	700(655)	800(755)	1500(1455)						

**AIRCRAFT UNABLE TO RECEIVE DME I-HDN**  
Advise ATC. Subject to ATC approval, radar ranges will be provided at 7.5NM outbound and at 4.5NM inbound.

**AIRCRAFT UNABLE TO RECEIVE RANGE INFORMATION**  
CAT A fly outbound for 3 MIN, CAT B 2.5 MIN and CAT C 2 MIN.

**NOTE** FAT is offset 4° from RWY C/L and crosses RWY C/L nominally 0.75NM before THR.

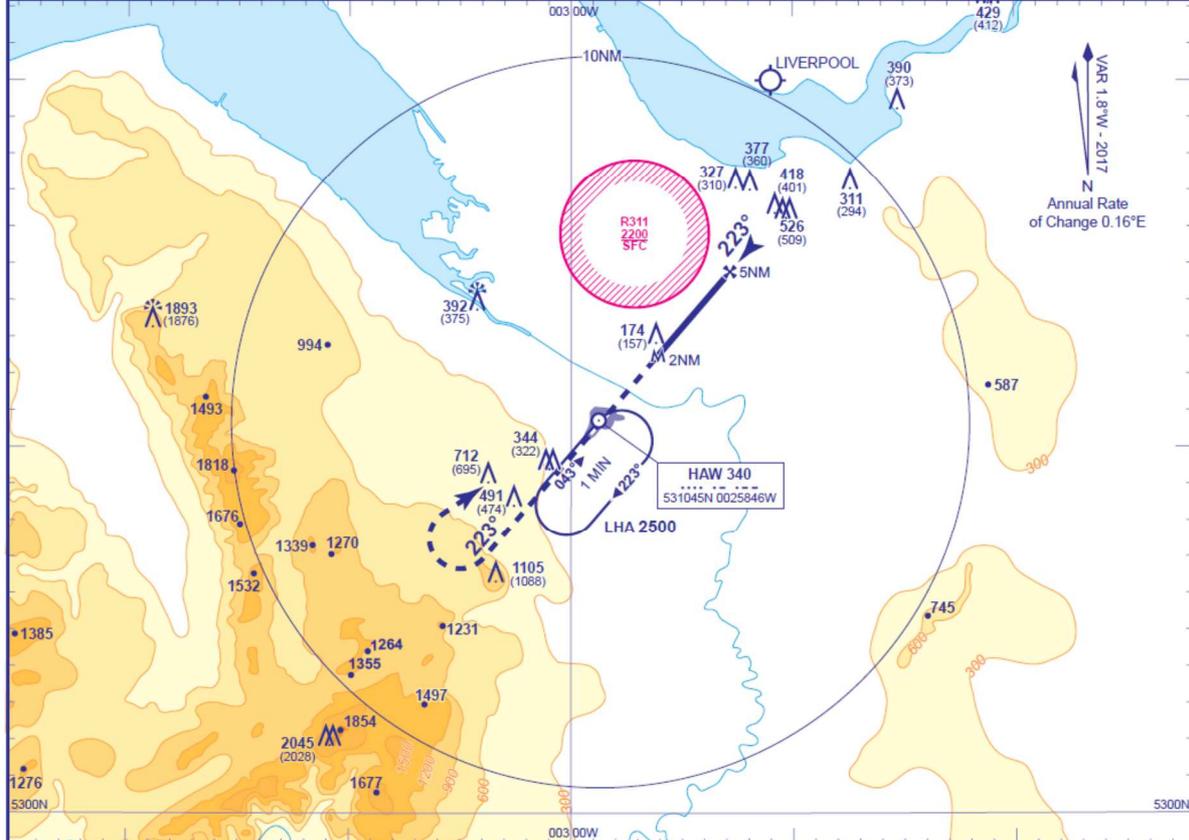
**CHANGE (6/17):** MAG VAR. MAG TRACKS. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.

AERO INFO DATE 14 MAR 17

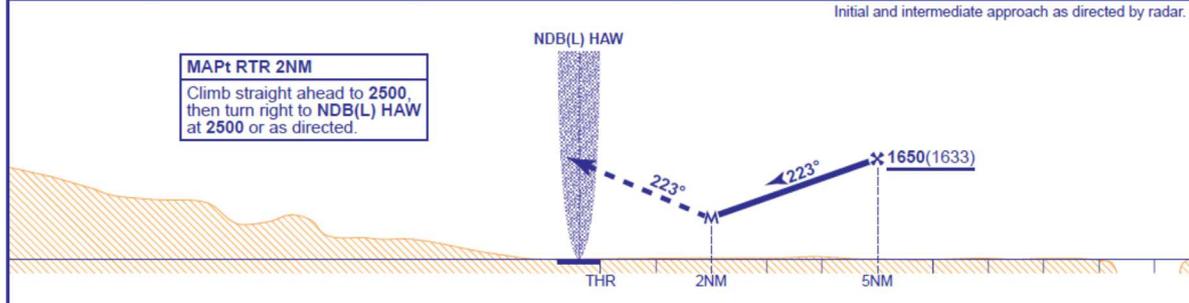
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN**  
**SRA RTR 2NM**  
**RWY 22**  
 (ACFT CAT A,B,C)

		TWR 124.950	HAWARDEN TOWER	AD ELEVATION	45
		RAD 123.350	HAWARDEN RADAR	THR ELEVATION	17
		130.015*	HAWARDEN DIRECTOR	OBSTACLE ELEVATION	2045 AMSL (2028) (ABOVE THR)
		ATIS 125.425	HAWARDEN INFORMATION	BEARINGS ARE MAGNETIC	
*As directed by ATC, Not continuously monitored				TRANSITION ALTITUDE	5000



RADAR ADVISORY HEIGHTS Gradient 5.2%, 320FT/NM				
NM	5	4	3	2
ALT(HGT)	1650(1633)	1280(1263)	970(953)	650(633)



Aircraft Category		A	B	C	Rate of descent	G/S KT	160	140	120	100	80
		Procedure	650(633)	650(633)		650(633)	FT/MIN	840	740	630	530
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)								
	East of RWY 04/22	700(655)	800(755)	1500(1455)							

**NOTE** Aircraft must remain outside R311 at all times.

CHANGE (6/17): MAG VAR. OBSTACLES. HAWARDEN DIRECTOR FREQUENCY ADDED.

AERO INFO DATE 14 MAR 17

## Appendix B Reference Documents

Abbreviation	Full document title
CAP 393	The Air Navigation Order 2009
CAP 493	Manual of Air Traffic Services Part 1
CAP 670	Air Traffic Services Safety Requirements
CAP 724	The Airspace Charter
CAP 725	CAA Guidance on the Application of the Airspace Change Process
EC Regulation 2096/2005	Common Requirements for the Provision of Air Navigation Services.
CAP 774	UK Flight Information Services
CAP 785	Approval Requirements for Instrument Flight Procedures for Use in UK Airspace
ICAO Annex 11	Air Traffic Services
ICAO Doc 4444	Procedures for Air Navigation – Air Traffic Management
ICAO Doc 8168 (PANS-OPS)	Procedures for Air Navigation Services – Aircraft Operations Vol I: Flight Procedures Vol II: Construction of Visual and Instrument Flight Procedures
ICAO Doc 9163	Performance-Based Navigation Manual
UK AIP (CAP 393)	United Kingdom Aeronautical Information Publication

## Appendix C List of Consultees

### C.1. Development of the consultee list

C.1.1 This section is included so that consultees understand why they have been included on the consultation list.

### C.2 Airport user consultees

Eastern Airways  
Flintshire Flying School  
National Police Air Service  
Airbus Helicopters  
Aviation Park Group  
Raytheon Systems Ltd  
Airbus Transport International  
Airbus PR Office  
APEM Limited  
JD Aviation  
Grosvenor  
North Wales Military Aviation Services (NWMAS)  
Exec Jet Charter (Williams)  
Signum  
Jefferson Air Photography

### C.3 Off-airport aerodrome and airspace user consultees

NWHPGC  
Liverpool Airport ATC  
Warton ATC  
PC Wal Sector  
RAF Valley  
RAF Shawbury  
Sleep Airfield  
North Wales Gliding Club  
Ashcroft Farm Airstrip  
Poulton South Airfield  
Bryngwynbach Airstrip  
Rhedyn Coch Airstrip  
Gresford Airstrip  
North West Air Ambulance  
Helicopter and Aviation Services  
Skydive Tilstock  
Manchester Airport ATC  
Cheshire Microlights  
Denbigh Gliding Club  
Mid Wales Airport  
Shropshire Aero Club  
Manchester City Airport  
Lancashire Aero Club  
Mersey Flight  
Liverpool Flying School  
Lomac Aviators

Raven Air

#### C.4 NATMAC Consultees

AOA

Aircraft Owners & Pilots Association (AOPA)

BAE Systems

British Airline Pilots' Association (BALPA)

British Balloon & Airstrip Club (BBAC)

British Gliding Association (BGA)

British Helicopter Association (BHA)

British Model Flying Association (BMFA)

European UAV Systems Centre Ltd

Guild of Air Pilots & Air Navigators (GAPAN)

Helicopter Club of Great British (HCGB)

National Air Traffic Services (NATS)

Aviation Environment Federation

British Air Transport Association (BATA)

British Airways

British Business & General Aviation Association (BBGA)

British Hand Gliding & Paragliding Association (BHPA)

British Microlight Aircraft Association (BMAA)

British Parachuting Association (BPA)

General Aviation Safety Council (GASCo)

Guild of Air Traffic Control Officers (GATCO)

Light Aircraft Association (LAA)

PPL/IR Europe

CAA

Light Airlines

#### C.5 NATMAC military consultees

DAATM

#### C.6 Local Parish and District Councils

Abenbury Community Council

Acton Community Council

Bangor Isycoed Community Council

Bronington Community Council

Broughton Community Council

Caia Park Community Council

Cefn Community Council

Gresford Community Council

Gwersyllt Community Council

Holt Community Council

Llay Community Council

Pen-y-cae Community Council

Rhosddu Community Council

Rossett Community Council

Argoed Community Council

Broughton and Bretton Community Council

Brynford Community Council

Buckley Town Council  
Cilcain Community Council  
Connah's Quay Town Council  
Flint Town Council  
Gwernaffield and Pantymwyn Community Council  
Gwernymynydd Community Council  
Halkyn Community Council  
Hawarden Community Council  
Higher Kinnerton Community Council  
Holywell Town Council  
Hope Community Council  
Leeswood and Pontblyddyn Community Council  
Llanfynydd Community Council  
Mold Town Council  
Mostyn Community Council  
Nannerch Community Council  
Nercwys Community Council  
Northop Community Council  
Penyffordd Community Council  
Queensferry Community Council  
Saltney Town Council  
Sealand Community Council  
Shotton Town Council  
Treuddyn Community Council  
Aldford and Saughton Parish Council  
Alvanley Parish Council  
Backford Parish Council  
Christleton Parish Council  
Churton Parish Council  
Coddington and District Parish Council  
Dodleston Parish Council  
Dunham on the Hill and Hapsford Parish Council  
Eaton and Eccleston Parish Council  
Elton Parish Council  
Farndon Parish Council  
Great Boughton Parish Council  
Guilden Sutton Parish Council  
Handley Parish Council  
Helsby Parish Council  
Huntington Parish Council  
Ince Parish Council  
Kingsmead Parish Council  
Lea By Backford Parish Council  
Little Stanney Parish Council  
Littleton Parish Council  
Mollington Parish Council  
Poulton and Pulford Parish Council  
Rowton Parish Council  
Saughall and Shotwick Park Parish Council  
Thornton Le Moors Parish Council  
Upton-by-Chester Parish Council  
Waverton Parish Council  
Bryneglwys Parish Council  
Clocaenog Parish Council

Cyffylliog Parish Council  
Efenechtyd Parish Council  
Llanarmon yn Iâl Parish Council  
Llandegla Parish Council  
Llanfair Dyffryn Clwyd Parish Council  
Llanferres Parish Council  
Llantysilio Parish Council

## APPENDIX D Consultees Contact Details, Feedback & Response

Consultee Details:	Feedback & Date:	Our Comments / Mitigation:
<b>Airport user consultees</b>		
Eastern Airways	No Response Received	N/A
Flintshire Flying School	No Response Received.	N/A
National Police Air Service	No Response Received.	N/A
Airbus Helicopters	No Response Received.	N/A
Aviation Park Group	No Response Received.	N/A
Raytheon Systems Ltd	No Response Received.	N/A
Airbus Transport International	02/02/2018 Requested extension to consultation period	E-mail sent 09/02/2018 thanking for response but stating consultation is ending as planned but we are willing to listen to points that they have. No further issues raised.
Airbus PR Office	No Response Received.	N/A
APEM Limited	No Response Received.	N/A
JD Aviation	No Response Received.	N/A
Grosvenor	No Response Received.	N/A
North Wales Military Aviation Services (NWMAS)	No Response Received.	N/A
Exec Jet Charter (Williams)	No Response Received.	N/A
Signum	No Response Received.	N/A
Jefferson Air Photography	No Response Received.	N/A
<b>Off-airport aerodrome and airspace user consultees</b>		
NWHPGC	04/12/17 Did not feel it was relevant to their operations.	N/A
Liverpool Airport ATC	22/11/2017 Potential impact on future capacity	Meetings held and email exchanges to establish mitigations. See minutes of meeting and copies of communication at appendix E
Warton ATC	No Response Received.	N/A
PC Wal Sector	No Response Received.	N/A
RAF Valley	No Response Received.	N/A
RAF Shawbury	No Response Received.	N/A

Sleap Airfield	No Response Received.	N/A
North Wales Gliding Club	02/02/2018 Response Received via BGA	See BGA entry
Ashcroft Farm Airstrip	No Response Received.	N/A
Poulton South Airfield	No Response Received.	N/A
Bryngwynbach Airstrip	No Response Received.	N/A
Rhedyn Coch Airstrip	No Response Received.	N/A
Gresford Airstrip	No Response Received.	N/A
North West Air Ambulance	No Response Received.	N/A
Helicopter and Aviation Services	No Response Received.	N/A
Skydive Tilstock	No Response Received.	N/A
Manchester Airport ATC	No Response Received.	N/A
Cheshire Microlights	No Response Received.	N/A
Denbigh Gliding Club	02/02/2018 Response Received via BGA	See BGA entry
Mid Wales Airport	No Response Received.	N/A
Shropshire Aero Club	No Response Received.	N/A
Manchester City Airport (Barton)	11/11/2017 Will distribute accordingly	N/A
Lancashire Aero Club	No Response Received.	N/A
Mersey Flight	No Response Received.	N/A
Liverpool Flying School	No Response Received.	N/A
Lomac Aviators	No Response Received.	N/A
Raven Air	No Response Received.	N/A
<b>NATMAC Consultees</b>		
AOA	No Response Received.	N/A
Aircraft Owners & Pilots Association (AOPA)	No Response Received.	N/A
BAE Systems	No Response Received.	N/A
British Airline Pilots' Association (BALPA)	No Response Received.	N/A
British Balloon & Airstrip Club (BBAC)	No Response Received.	N/A

British Gliding Association (BGA)	02/02/2018 Jointly Responded for BGA, NWGC and Denbigh Gliding Club.  Responded through British Gliding Club Objecting to having no reference of the location of the GC on the plates and asks for a note to make pilots aware of the existence on winch cables up to 3,200' and the potential presence of gliders soaring locally	E-mail sent 09/02/2018 thanking for response and will respond within 21 days. Follow up email sent on 27/02/2018 (see email references at appendix D2)
British Helicopter Association (BHA)	No Response Received.	N/A
British Model Flying Association (BMFA)	No Response Received.	N/A
European UAV Systems Centre Ltd	No Response Received.	N/A
Guild of Air Pilots & Air Navigators (GAPAN)	No Response Received.	N/A
Helicopter Club of Great British (HCGB)	No Response Received.	N/A
National Air Traffic Services (NATS)	No Response Received.	N/A
Aviation Environment Federation	No Response Received	N/A
British Air Transport Association (BATA)	No Response Received	N/A
British Airways	No Response Received.	N/A
British Business & General Aviation Association (BBGA)	No Response Received.	N/A
British Hand Gliding & Paragliding Association (BHPA)	No Response Received.	N/A
British Microlight Aircraft Association (BMAA)	No Response Received.	N/A
British Parachuting Association (BPA)	No Response Received.	N/A
General Aviation Safety Council (GASCo)	No Response Received.	N/A
Guild of Air Traffic Control Officers (GATCO)	08/02/2018 GATCO supports the proposal. However several cautionary notes are included in the response relating to implementation and operation. (see Reference A Correspondence 002)	12/02/2018 Email response sent thanking them for their participation.
Light Aircraft Association (LAA)	No Response Received.	N/A
PPL/IR Europe	No Response Received.	N/A
CAA	No Response Received.	N/A



Light Airlines	No Response Received.	N/A
<b>NATMAC military consultees</b>		
DAATM	No Response Received.	N/A
<b>Local Parish and District Councils;</b>		
Abenbury Community Council	No Response Received.	N/A
Acton Community Council	07/12/17. Welcomes new GNSS	E-mail sent 07/02/2018 thanking them for response
Bangor Isycoed Community Council	No Response Received.	N/A
Bronington Community Council	No Response Received.	N/A
Broughton Community Council	No Response Received.	N/A
Caia Park Community Council	No Response Received.	N/A
Cefn Community Council	No Response Received.	N/A
Gresford Community Council	02/02/18. forwarding this on in case anyone would like to comment as individuals	E-mail sent 05/02/2018 thanking for response, encouraging distribution
Gwersyllt Community Council	No Response Received.	N/A
Holt Community Council	No Response Received.	N/A
Llay Community Council	No Response Received.	N/A
Pen-y-cae Community Council	No Response Received.	N/A
Rhosddu Community Council	No Response Received.	N/A
Rossett Community Council	No Response Received.	N/A
Argoed Community Council	No Response Received.	N/A
Broughton and Bretton Community Council	No Response Received.	N/A
Brynford Community Council	No Response Received.	N/A
Buckley Town Council	02/20/18 response is that the GNSS procedure proposals seem entirely proper and necessary	E-mail sent 05/02/2018 thanking them for response

Cilcain Community Council	No Response Received.	N/A
Connah's Quay Town Council	No Response Received.	N/A
Flint Town Council	No Response Received.	N/A
Gwernaffield and Pantymwyn Community Council	No Response Received.	N/A
Gwernymynydd Community Council	No Response Received.	N/A
Halkyn Community Council	No Response Received.	N/A
Hawarden Community Council	02/02/2018 Sending out for review No further Responses Received.	E-mail sent thanking for response. Will look to get comments ASAP.
Higher Kinnerton Community Council	No Response Received.	N/A
Holywell Town Council	No Response Received.	N/A
Hope Community Council	No Response Received.	N/A
Leeswood and Pontblyddyn Community Council	No Response Received.	N/A
Llanfynydd Community Council	No Response Received.	N/A
Mold Town Council	No Response Received.	N/A
Mostyn Community Council	No Response Received.	N/A
Nannerch Community Council	No Response Received.	N/A
Nercwys Community Council	No Response Received.	N/A
Northop Community Council	02/02/2018  At their meeting on 8th January, members welcomed any steps to improve safety at any airport and are grateful for the opportunity to comment on the positive proposals at Hawarden.	E-mail sent 05/02/2018 thanking for response
Penyffordd Community Council	No Response Received.	N/A
Queensferry Community Council	No Response Received.	N/A
Saltney Town Council	No Response Received.	N/A
Sealand Community Council	No Response Received.	N/A
Shotton Town Council	No Response Received.	N/A
Treuddyn Community Council	No Response Received.	N/A
Aldford and Saighton Parish Council	No Response Received.	N/A

Alvanley Parish Council	No Response Received.	N/A
Backford Parish Council	02/02/2018 Will review and distribute and response if any issues  No further response received.	N/A
Christleton Parish Council	No Response Received.	N/A
Churton Parish Council	No Response Received.	N/A
Coddington and District Parish Council	No Response Received.	N/A
Dodleston Parish Council	No Response Received.	N/A
Dunham on the Hill and Hapsford Parish Council	No Response Received.	N/A
Eaton and Eccleston Parish Council	No Response Received.	N/A
Elton Parish Council	No Response Received.	N/A
Farndon Parish Council	No Response Received.	N/A
Great Boughton Parish Council	No Response Received.	N/A
Guilden Sutton Parish Council	No Response Received.	N/A
Handley Parish Council	No Response Received.	N/A
Helsby Parish Council	08/01/2018 No objections to proposal	E-mail sent 09/01/2018 thanking for response
Huntington Parish Council	No Response Received.	N/A
Ince Parish Council	No Response Received.	N/A
Kingsmead Parish Council	No Response Received.	N/A
Lea By Backford Parish Council	No Response Received.	N/A
Little Stanney Parish Council	No Response Received.	N/A
Littleton Parish Council	No Response Received.	N/A
Mollington Parish Council	No Response Received.	N/A
Poulton and Pulford Parish Council	No Response Received.	N/A
Rowton Parish Council	No Response Received.	N/A
Saughall and Shotwick Park Parish Council	No Response Received.	N/A
Thornton Le Moors Parish Council	No Response Received.	N/A
Upton-by-Chester Parish Council	No Response Received.	N/A
Waverton Parish Council	No Response Received.	N/A

Bryneglwys Parish Council	No Response Received.	N/A
Clocaenog Parish Council	No Response Received.	N/A
Cyffylliog Parish Council	No Response Received.	N/A
Efenechtyd Parish Council	05/02/18 Feels it is not relevant to their council	E-mail sent 05/02/2018 stating why they are in the consultation (due to being 1.5NM within tracks)no further response received.
Llanarmon yn Iâl Parish Council	No Response Received.	N/A
Llandegla Parish Council	No Response Received.	N/A
Llanfair Dyffryn Clwyd Parish Council	No Response Received.	N/A
Llanferres Parish Council	No Response Received.	N/A
Llantysilio Parish Council	No Response Received.	N/A

## Appendix D Reference A – Consultation Correspondence



Sent: 05 February 2019 09:11

**To:** Safeguarding

**Subject:** Proposal to adopt GNSS approaches at Hawarden airfield

This is a response to your proposal to adopt GNSS approaches at Hawarden airfield.

The British Gliding Association represents 80 gliding clubs and some 7000 pilots.

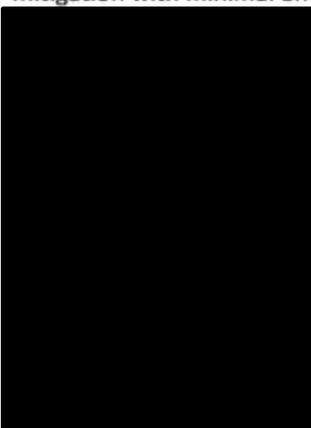
We welcome the statement in 1.7.6 that the ACP is not a precursor to CAS, however we feel compelled to state here our objection on safety grounds to the airspace change proposal as currently written.

We note from the ACP that the procedures take traffic bound for runway 04 into a turn at c. 11.2 DM, likely to be close to c.3,100' asl overhead North Wales Gliding Club while no reference is made to gliding activities. NWGC is clearly marked on the 1:500,000 VFR charts as having winch launching to 3,200' asl. While the arrangements between Hawarden and NWGC do create controller awareness of gliding activity this situation creates the potential for airproxes with Cat C and indeed the more frequent training Class A and B flights mitigated by only controller intervention, and as a single point of potential failure we believe that this is inadequate.

We understand that the options to redraw the procedures are limited and are not suggesting that this should take place. We do however believe that the procedural charts should:-

- a) show the location of the GC on the plates or equivalent
- b) add a note to make pilots aware of the existence on winch cables up to 3,200' and the potential presence of gliders soaring locally.

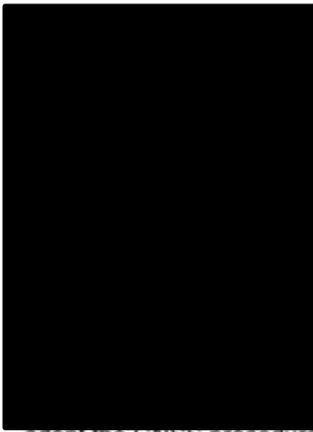
These points would ensure aircrew awareness which would enhance look-out and thereby add an additional mitigation with minimal effort. **Subject to these changes** we would have no objection to the ACP.



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...RSCO IAL LTD)  
...:43  
...bete@gliding.co.uk>  
...h.ia.crawford@airbus.com>  
...proposal

...se to our ACP regarding the adoption of GNSS approaches at Hawarden.

...nd suggestions.

...ents in the post consultation report and any subsequent application to change airspace (to adopt the GNSS procedures).

We already have very close coordination with the North Wales Gliding Club who operate from Llantisilio and have extant procedures to accommodate the existing conventional Instrument Approach Procedures. Additionally the gliding site is depicted on the radar displays at Hawarden. In principle I agree that greater awareness of gliding activity will increase safety for all, but note that a similar suggestion of annotating approach plates was declined by the CAA due to the potential for clutter and confusion.

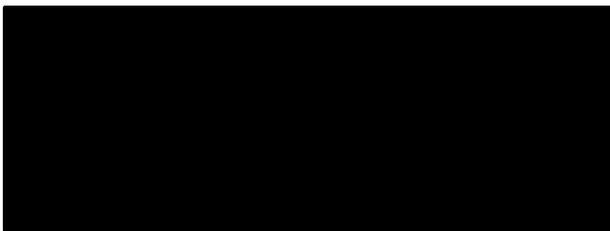
One counter argument that could be raised is that although a winch launch site introduces the hazard of a cable and will inevitably have a higher concentration of aircraft taking off and landing, the entire Clywdian range is a focal area for gliding activity, so awareness of gliding activities in the whole area should be promoted.

We will however discuss the possibility of incorporation of the gliding site on the chart with the CAA.

Regards.

Mark

Mark Downes  
Manager Air Traffic Services  
Hawarden Airport ATC Unit



**Disclaimer**

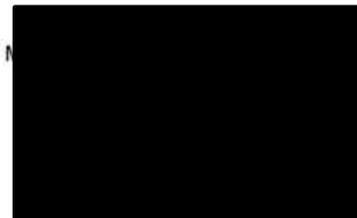
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**Response 002**



The Guild of Air Traffic Control Officers

**GUILD OF AIR TRAFFIC CONTROL OFFICERS**



8<sup>th</sup> February 2018

Dear Sir/Madam

Thank you for the opportunity to comment on the proposed GNSS approaches and the amendment to conventional IFR procedures at Hawarden Airport.

The Guild of Air Traffic Control Officers (GATCO) is a UK-wide professional organisation which promotes the highest standards in all aspects of air traffic management and is dedicated to the safety of all who travel or gain their livelihood in the air, with membership drawn from both civilian and military controllers. We are heavily involved in the work of the International Federation of Air Traffic Controllers' Associations (IFATCA), which includes representations to ICAO and SES, amongst others.

This letter constitutes our formal response to the consultation.

GATCO **supports** all the changes proposed.

The proposed implementation of GNSS approaches are vital to any modern ATC system today. The future of air traffic management is based on global positioning systems and it is incumbent for ATC and the airspace providers to keep up with the changes. GATCO fully agrees with the benefits put forward.

The proposed changes to the conventional IFR procedures are to align with ICAO procedures and as such we see no issue with any change in line with ATC procedures.

One thing to note however, and I am sure this has been picked up during your stakeholder meetings with controllers present, is the fact that pilots might not fly the anticipated descent profile.

With more information on the flight deck like distance from touchdown, pilots might be inclined to adjust their rate of descent. I myself am no expert on your airspace or the restrictions present, but this could result in inadvertent penetrations of controlled airspace.

When any change takes place the risk for deviations by aircraft is high. Care must be taken during the implementation phase to protect the controllers and aircraft alike.

Thank you for allowing us the time to respond to your change proposal.

Yours Sincerely,



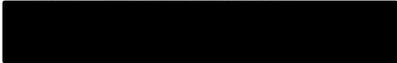
Adam Exley  
MTO  
GATCO

A Member of The International Federation of Air Traffic Controllers' Associations (IFATCA)

## APPENDIX E Liverpool Airport Meeting Minutes and Correspondence



Date 22<sup>nd</sup> November 2017



Ian Crawford  
Airbus Operations Limited  
Building 53  
Chester Road  
Broughton  
Flintshire CH4 0DR

**Subject: Introduction of GNSS Approach at Hawarden Airport**

Dear Ian,

Thank you for inviting LJLA to comment on the Airbus proposal to introduce GNSS approaches at Hawarden Airport.

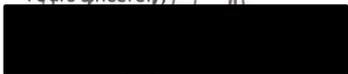
LJLA want to work with Airbus on this matter to find a mutual agreed solution. At the moment there are a couple of items that are of concern. I have listed three of these matters below to highlight some of our concerns:

- The new GNSS proposal has the potential to make an already complex traffic situation more restrictive for both operations. Aircraft approaching Hawarden on 23 Runway will be up to 1.5 nm closer to runway 27 final approach at LJLA. This has the potential to stop all LJLA aircraft activity for prolonged periods.
- We would like to understand how many movements would be seeking to use the new GNSS proceed, e.g. <1% of all Hawarden Airport movements.
- There may have been some confusion over our interpretation of preliminary discussion between Mark Downes and Mark Spedding and my colleagues Chris Kelly and Matthew Jackson. It was our understanding that the new proposal would effectively replicate the route and airspace currently used for the existing procedural approach. Also that any changes to accommodate the Belugo XL would be within the current RMA northern boundary and that any request from yourselves to extend the eastern boundary would go through a joint risk assessment process.

To help resolve this matter as quickly and practically as possible, I am proposing that we aim to meet at 2pm on 8<sup>th</sup> December 2017 for an urgent stakeholder discussion. We can come to Hawarden or you are welcome to come and visit us at Liverpool, the important thing is we meet without delay.

I look forward to meeting in the near future to help resolve any potential differences.

Yours sincerely,



Head of Environment

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<b>Minutes of meeting</b>	
To All Attendees  Copy Venue: MRM-BT-23-Clwyd room, Airbus Broughton	From Catalina Peters GWLUA Aerodrome Management T +0044 1244 522486 E catalina.peters@airbus.com Ref: GNSS consultation_01  Issued: 21 December 2017

Subject of meeting	Date of meeting	
GNSS consultation – Liverpool airport meeting	6 Dec 2017	
Minutes	Actions	Date raised
<b>Attendees</b> Airbus: Catalina Peters(CP), Ian Crawford (IC) Serco ANSP: Mark Downes (MD) Liverpool Airport: Chris Kelly (CK), Kenton Lock (KL)		6 Dec 17
<b>Agenda:</b> <ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Discussion on impact of Hawarden proposed GNSS procedures on Liverpool airport operations</li> <li>3. Next steps</li> <li>4. AOB</li> </ol>		6 Dec 17
<b>1.Introduction.</b> IC/CP introduced the reason for the meeting whilst we are in consultation for the GNSS procedures proposed to be implemented once approved by CAA.	CP	6 Dec 17
<b>2. Discussion on impact of Hawarden proposed GNSS procedures on Liverpool airport operations</b> The proposed procedures are following the current IFPs layout and there is little change. The current starts at 7.5nm and the proposed starts at 8.2nm (this is the source of the concern that the procedures is 1.5nm closer to Liverpool Final approach track – albeit measured this way it is 0.7nm closer). MD drew attention that notwithstanding this change to the FAF for GNSS and conventional approaches alike, the traffic scatter diagrams demonstrate that traffic disposition will be virtually identical to that at present (with the exception of traffic using the full procedure including the IAWP Rwy22). Liverpool GNSS can't have IAWP due to the surrounding airspace. The Liverpool designed GNSS procedures is an ILS overlay with FAF on centreline. Hawarden aerodrome has consulted with Liverpool in the very early stages when the Hazop session took place and Brian Currell has been involved. The design has taken into consideration Liverpool's airspace and its needs. However, Chris and Kenton were not aware of the early involvement and were taken by surprise with the proposed GNSS procedures and the impact on the airport and its delivery of service. Liverpool can't accept the IAP, MD has assured that the extent of the Hawarden Radar Manoeuvring Area will not change. KL/CK expressed concerns regarding the IAF which goes further into Liverpool's airspace and would affect future operations and capacity. KL stated they do not achieve the standard 5nm separation in the RMA, however it's deemed safe, as they know where all traffic is. CK – Liverpool ATC would not expect to vector to RNAV or approve and RNAV	CP/TSW	6 Dec 17

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Subject of meeting	Date of meeting	
GNSS consultation – Liverpool airport meeting	6 Dec 2017	
Minutes	Actions	Date raised
<p>approach for Hawarden traffic.</p> <p>MD when GNSS procedures approved they will be used for business continuity and for training purposes, or if ILS is not operational. CP – ILS is going to be maintained operational for the foreseeable future.</p> <p>New Beluga XL is proposed to have the same operational handling characteristic as the current A3ST, Liverpool will continue to vector as today for Beluga ST.</p> <p>KL We have to maintain the separation of IFR/VFR traffic.</p> <p>CK Environmental aspects – no impact on Liverpool.</p> <p>Liverpool is going ahead with airspace change and will start design soon. They have requested from Manchester the entry/exit points they can use, NERL are going to confirm.</p> <p>It was discussed that all Liverpool departures would be potentially to the south. This was not discussed during the FASI(N) working groups that have been attended by Hawarden and Liverpool.</p> <p>In overview;</p> <ol style="list-style-type: none"> <li>1. The proposed 04 GNSS approaches presented no issues to Liverpool traffic.</li> <li>2. The proposed 22 GNSS approach procedures may have an impact on Liverpool traffic, particularly if using the full procedure (as opposed to being radar vectored to the FAF. As a result appropriate coordination procedures will need to be documented in the relevant Letter(s) of Agreement.</li> </ol> <p>MD we could capture in the letter of agreement that :</p> <ol style="list-style-type: none"> <li>1. Use of the full GNSS procedure (Rwy 22) would normally only be for training and will be subject to constraints on usage similar to procedural approaches. (MD)</li> <li>2. Radar vectoring to the FAF (or IAF to be evaluated and agreed) will be treated in the same way as radar vectoring for the ILS 22 (providing Hawarden traffic is contained within the RMA)</li> <li>3. Risk/changes assessment based on what we know today in terms of traffic can be made. (KL/CK)</li> <li>4. Monitor and review within a year of implementation.(MD)</li> </ol> <p>CK/KL agreed with the proposed next steps and agreed to the steps without objecting to the proposed procedures.</p>		6 Dec 17
<p><b>8. Next steps:</b></p> <ol style="list-style-type: none"> <li>1. Respond to letter received from LJLA as discussed and as part of the consultation process.</li> <li>2. Amend letter of agreement when GNSS procedures are approved to capture points discussed.</li> </ol>	<p>IC/MD</p> <p>MD</p>	6 Dec 17

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Date: 4<sup>th</sup> January 2018  
[Redacted]

Ian Crawford  
Airbus Operations Limited  
Chester Road  
Broughton  
Flintshire CH4 0DR

**Subject:** Hawarden Airport Proposed GNSS Approaches

Dear Ian,

I would be like to take this opportunity to wish you and your colleagues at Airbus a happy and healthy new year.

I must apologise for not being able to make the meeting on the 6<sup>th</sup> December 2017 at Hawarden to discuss the ATC concerns about the proposed GNSS approach to runway 22 at Hawarden. Therefore, to avoid any confusion, I wanted to clarify a number of small but important points to make sure we are all have the same understanding of the proposed way forwards after your letter dated 13<sup>th</sup> December 2017.

Below are the points discussed at the meeting which I have suggested some amendments to help clarify which are in blue.

1. Use of the full GNSS procedure (runway 22) will be subject to constraints on usage similar to procedural approach for runway 22 **and the normal flight priorities as defined in MATS Part 1**
2. Radar vectoring to the FAF (or IAF to be evaluated and agreed) will be treated in the same way as radar vectoring for the ILS for runway 22 (providing Hawarden traffic is contained within the **current** RMA).
3. Risk/changes assessment based on what we know today in terms of traffic can be made. **I am sorry, we do not understand, please could you clarify further.**
4. **The change must be monitored continually by both ANSPs and formal reviewed at 3 month, 6 months and 12 months after implementation and then once per a year if there are no ongoing issues for Airbus and LLA.**

I hope this helps clarify the proposed way forwards, please can we arrange a mutual convenient time and date to discuss which will hopefully bring this matter to a satisfactory conclusion for both Airbus and LLA.

I look forward to hearing from you.

Yours sincerely,

[Redacted Signature]

Andrew Dutton  
Head of Environment

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Date 18<sup>th</sup> January 2018

Ian Crawford  
Aerodrome Compliance & Safeguarding Engineer  
Airbus Operations Limited  
Chester Road  
Broughton  
Flintshire CH4 0DR

**Subject: Proposal GNSS Approaches for Hawarden Airport**

Dear Ian,

This is a quick note following your letter of the 11<sup>th</sup> January 2018 concerning the airspace change proposal for GNSS approaches for Hawarden Airport with the aim of seeking absolute certainty that we both have the same long-term understanding about the new proposed GNSS procedures specifically for runway 22.

The point below relate to the numbering in your letter dated 11<sup>th</sup> January 2018.

1. It would avoid any ambiguity if the wording could be amended from .... *usage similar to procedural approaches* ..... to ..... **usage consistent with** procedural approaches .....
2. Is understood and agreed
3. LJLA want to be clear that we are not offering additional RNAV approach capacity for runway 22 and all the comments are predicate on the understanding that the Hawarden traffic using the proposed GNSS procedure is minimal that would not influence the current or predicted future aviation capacity at LJLA.

If necessary, I can come to see you to discuss these further to avoid and misunderstanding or misinterpretation of this letter or previous communications.

Thank you for your help on these matters.

Yours sincerely,

  
Andrew Dutton  
Head of Environment

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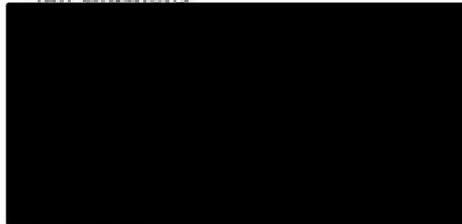
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Andrew Dutton



Ian Crawford



Our Reference: GNS5-LILA-07

19<sup>th</sup> February 2018

Subject: Response to LILA

Dear Andrew,

Following your letter raising items of concern for Liverpool John Lennon Airport, Hawarden Aerodrome invited Liverpool for a meeting on the 6<sup>th</sup> December.

This meeting was attended by Ian Crawford (Airbus), Catalina Peters (Airbus) and Mark Downes (Serco) on behalf of Hawarden Aerodrome and Chris Kelly and Kenton Lock from Liverpool Airport.

During the meeting the concerns raised by Liverpool Airport over the GNS5-22 approach at Hawarden which potentially will restrict air traffic movements for both airports.

Hawarden have agreed to capture all concerns in an amended letter of agreement when the GNS5 approaches have been approved, these are:

1. Use of the full GNS5 procedure (Flwy 22) would normally only be for training and will be subject to constraints on usage consistent with procedural approaches and the normal flight priorities as defined in MATS Part 1.
2. Radar vectoring to the FAF (or IAF to be evaluated and agreed) will be treated in the same way as radar vectoring for the ILS 22 (providing Hawarden traffic is contained within the current PMA).
3. The effectiveness of the procedures will be reviewed at regular intervals following implementation and documented. Any issues or concerns identified will be addressed by the ATC unit's normal change processes. Additionally, should there be any significant change in traffic levels (at either unit), frequency of use of the procedures or changes in any associated procedures, a review will be undertaken. For this

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purpose use of the full Runway 22 GNSB procedure by Hawarden more than 7 occasions on any day will trigger the review process.

With these changes to our letter of agreement we understand that you will have no further objections to our GNSB consultation.

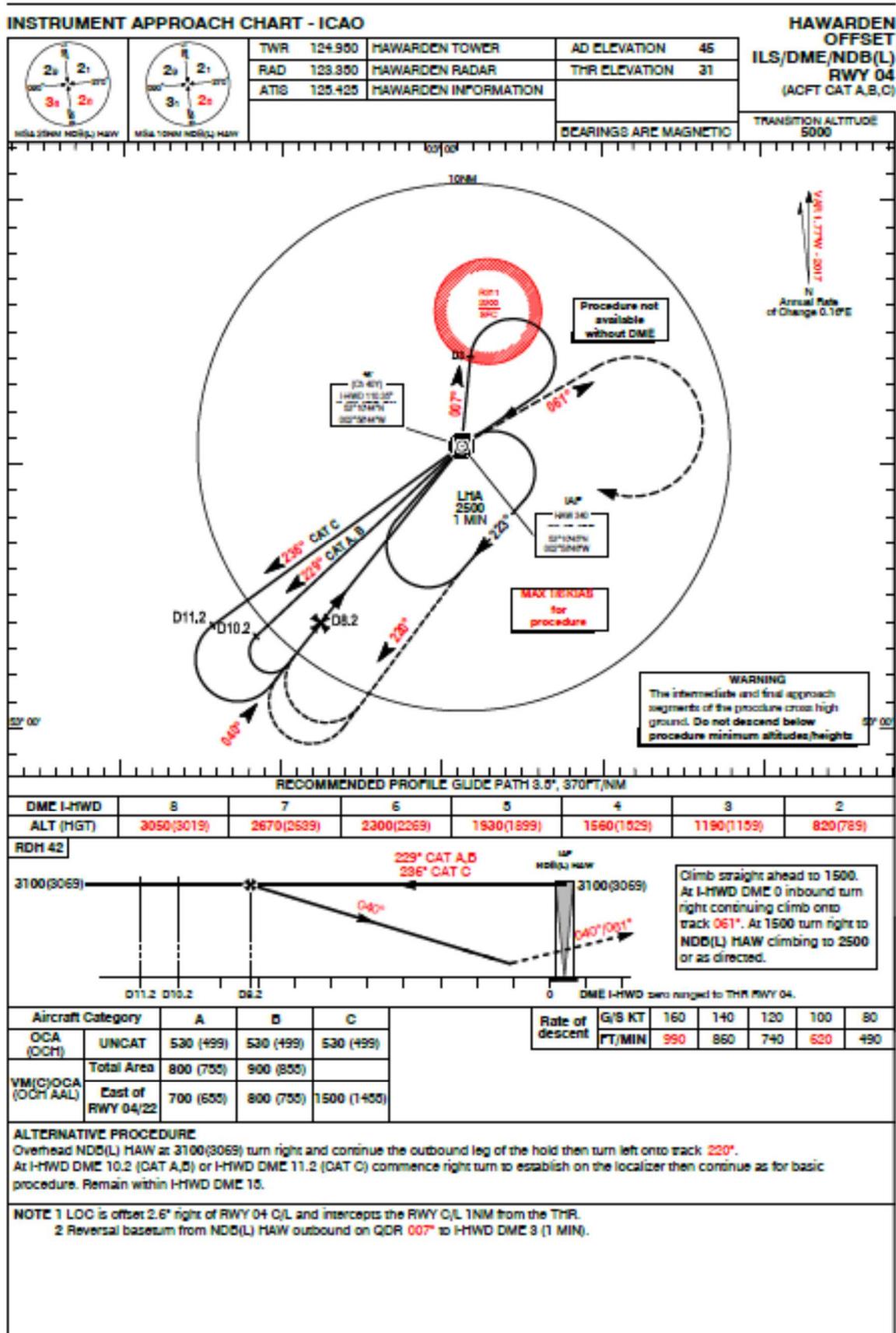
Yours sincerely,

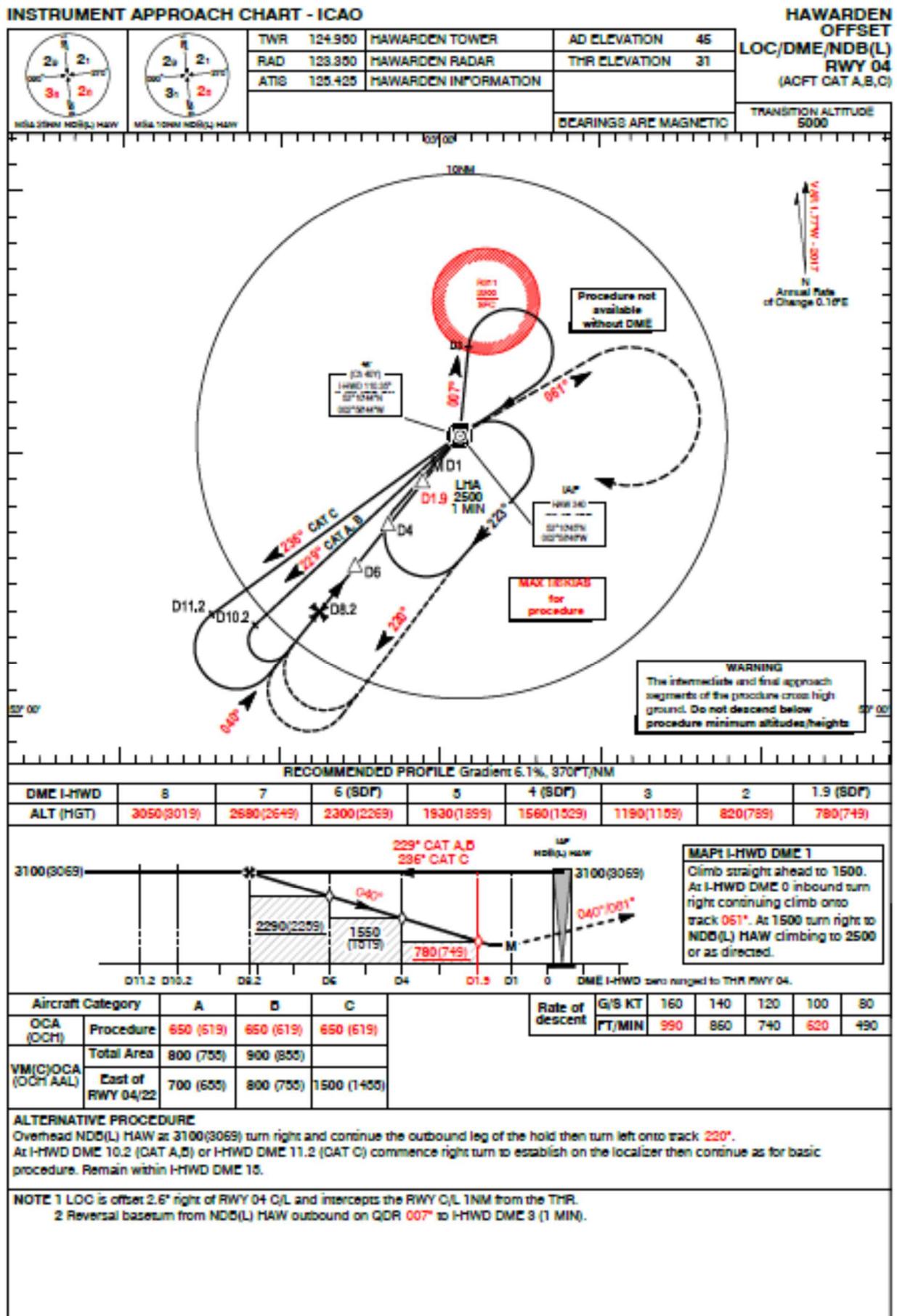


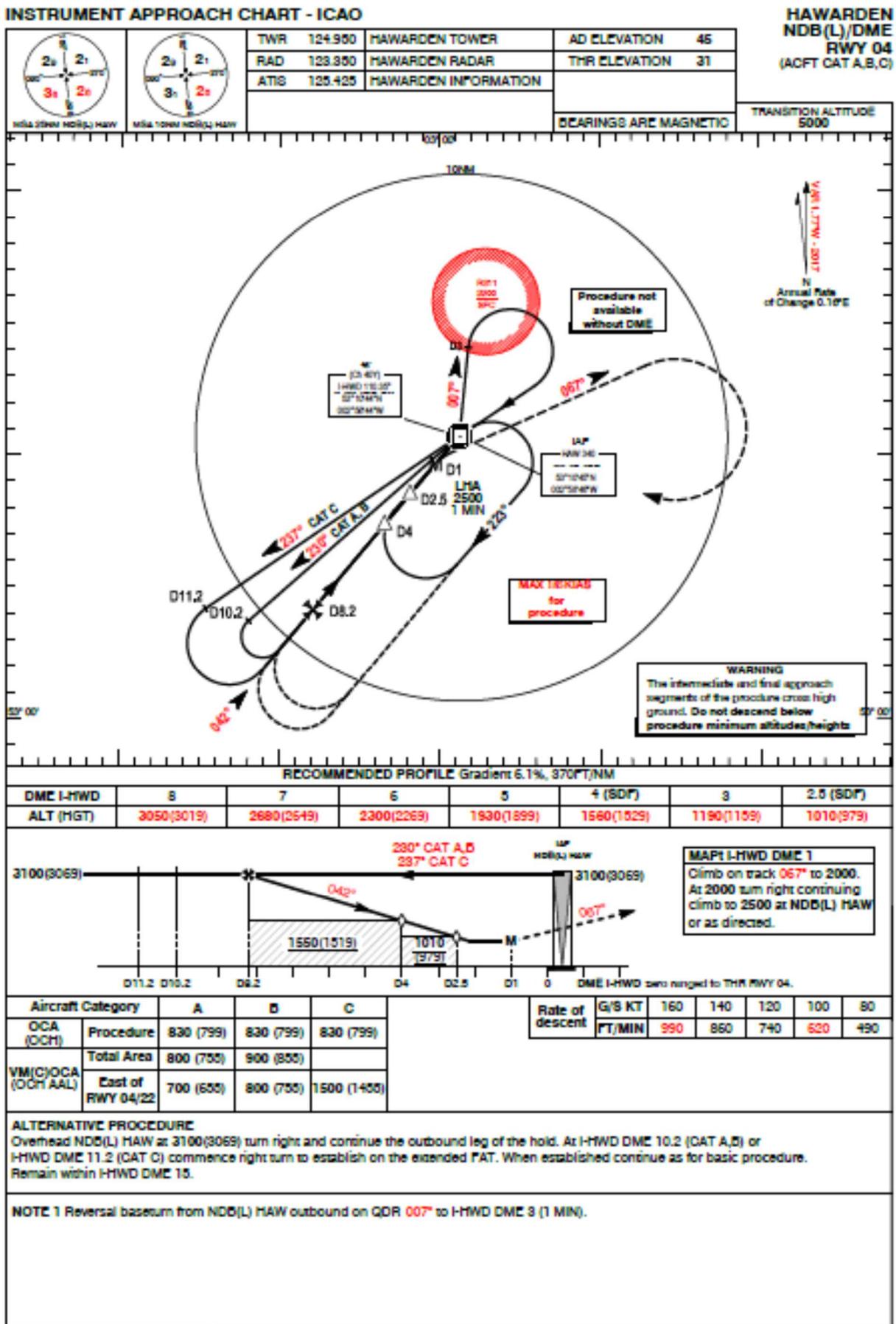
Jan Crawford  
Aerodrome Compliance and Safeguarding Engineer  
For and on behalf of Airbus Operations Ltd

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**APPENDIX F Amended conventional IFPs**



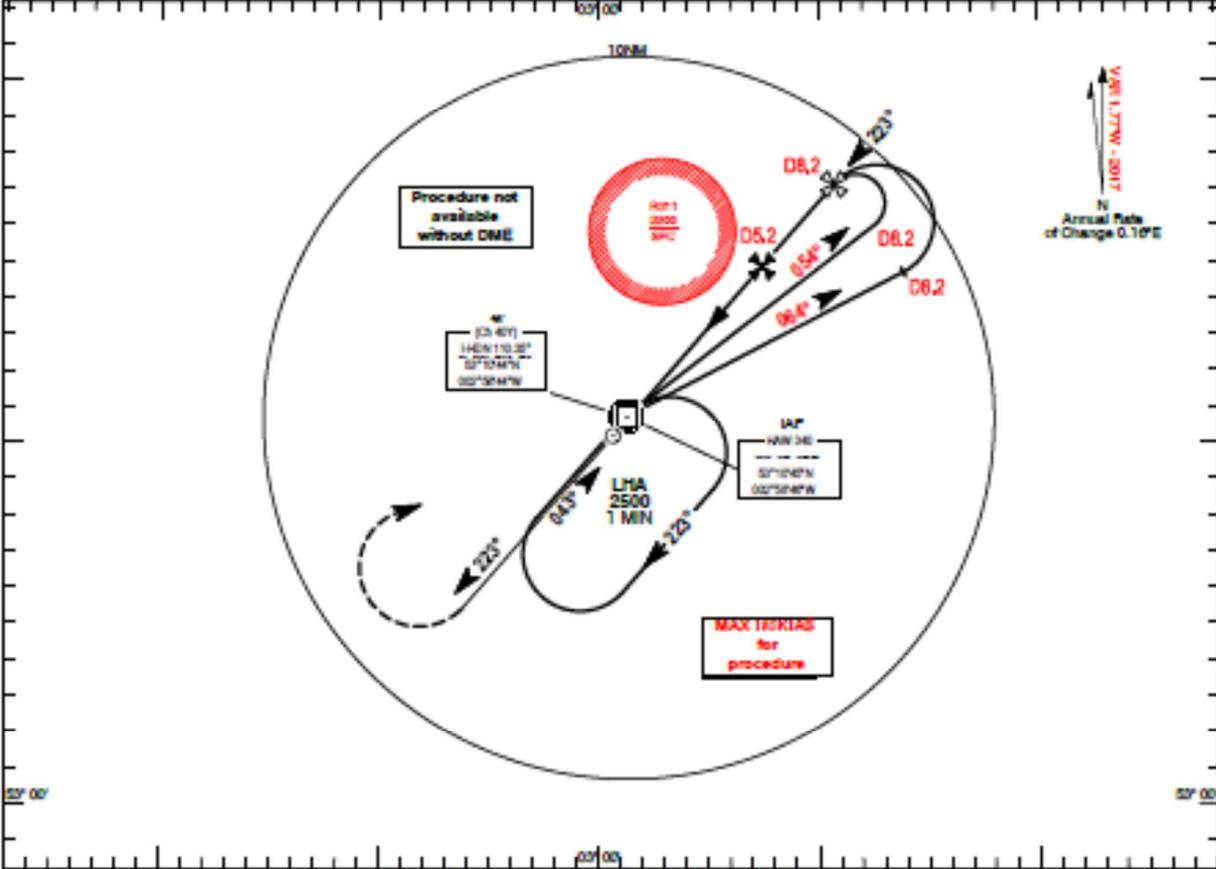




**INSTRUMENT APPROACH CHART - ICAO**

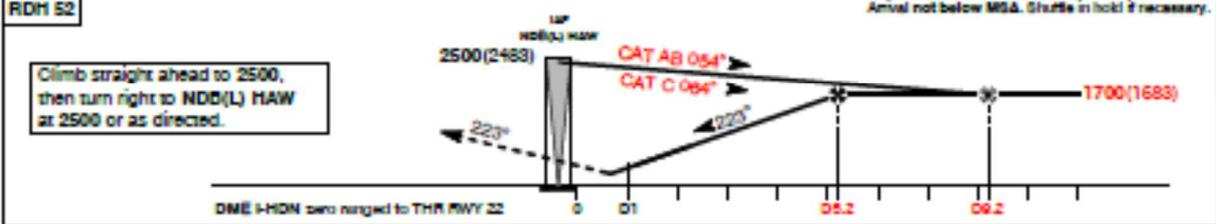
**HAWARDEN  
ILS/DME/NDB(L)  
RWY 22  
(ACFT CAT A,B,C)**

	TWR 124.900 HAWARDEN TOWER	AD ELEVATION 45
	RAD 123.300 HAWARDEN RADAR	THR ELEVATION 17
	ATIS 125.425 HAWARDEN INFORMATION	
		TRANSITION ALTITUDE 5000
		BEARINGS ARE MAGNETIC



RECOMMENDED PROFILE GLIDE PATH 3°, 320 FT/NM

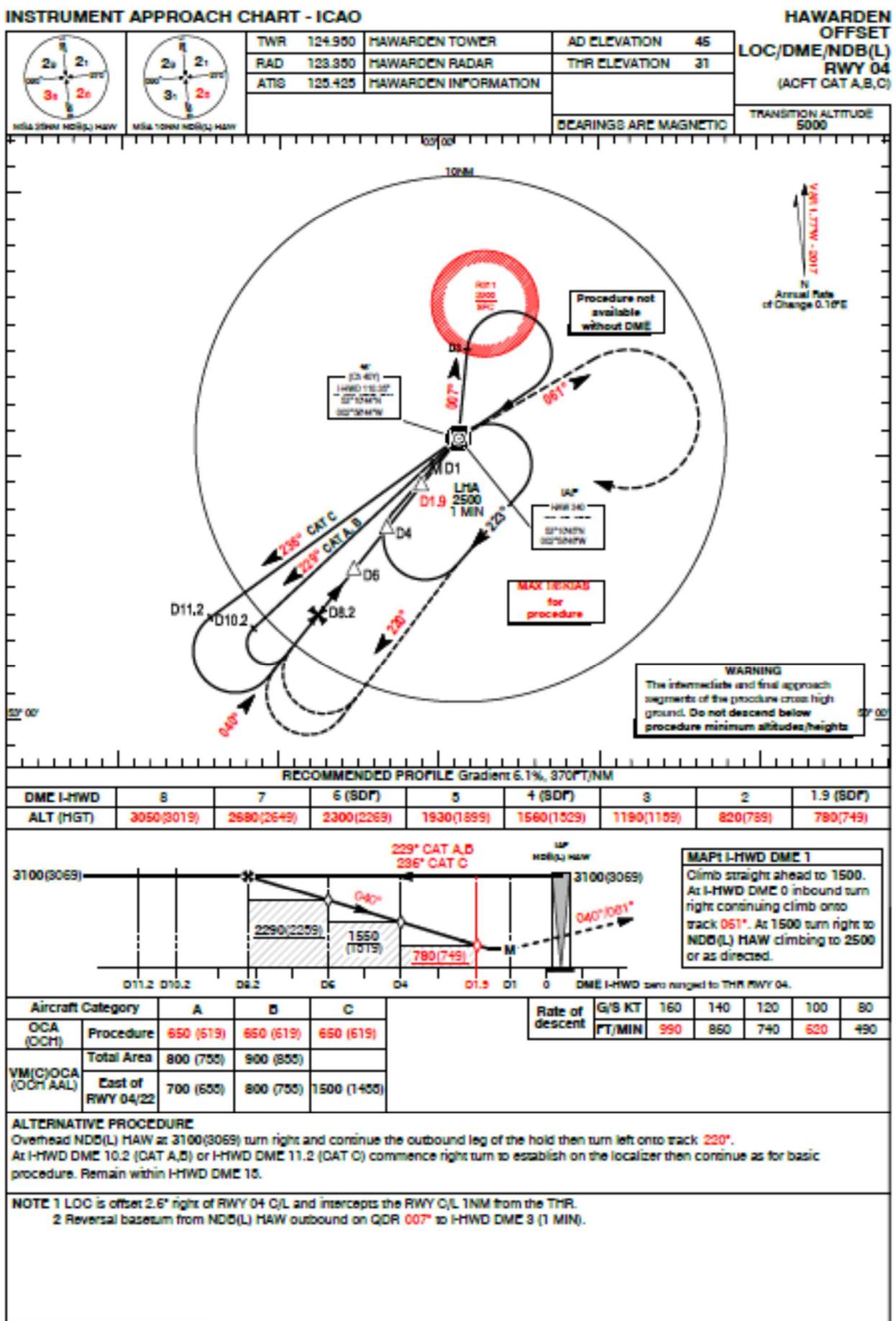
DME I-HDN	5	4	3	2	1
ALT (HGT)	1660(1643)	1340(1323)	1020(1003)	710(693)	390(373)



Aircraft Category	A	B	C	Rate of descent	G/S KT	160	140	120	100	80
OCA (OCH)	2.5% climb	380(363)	390(373)	400(383)	FT/MIN	840	740	630	530	420
	3% climb	270(253)	280(263)	290(273)						
VM(C)/OCA (OCH AAL)	Total Area	800(755)	800(855)	1500(1455)						
	East of RWY 04/22	700(655)	800(755)	1500(1455)						

**AIRCRAFT UNABLE TO RECEIVE DME I-HDN**  
Advise ATC. Subject to ATC approval, radar ranges will be provided at 8.2NM outbound and at 5.2NM inbound.

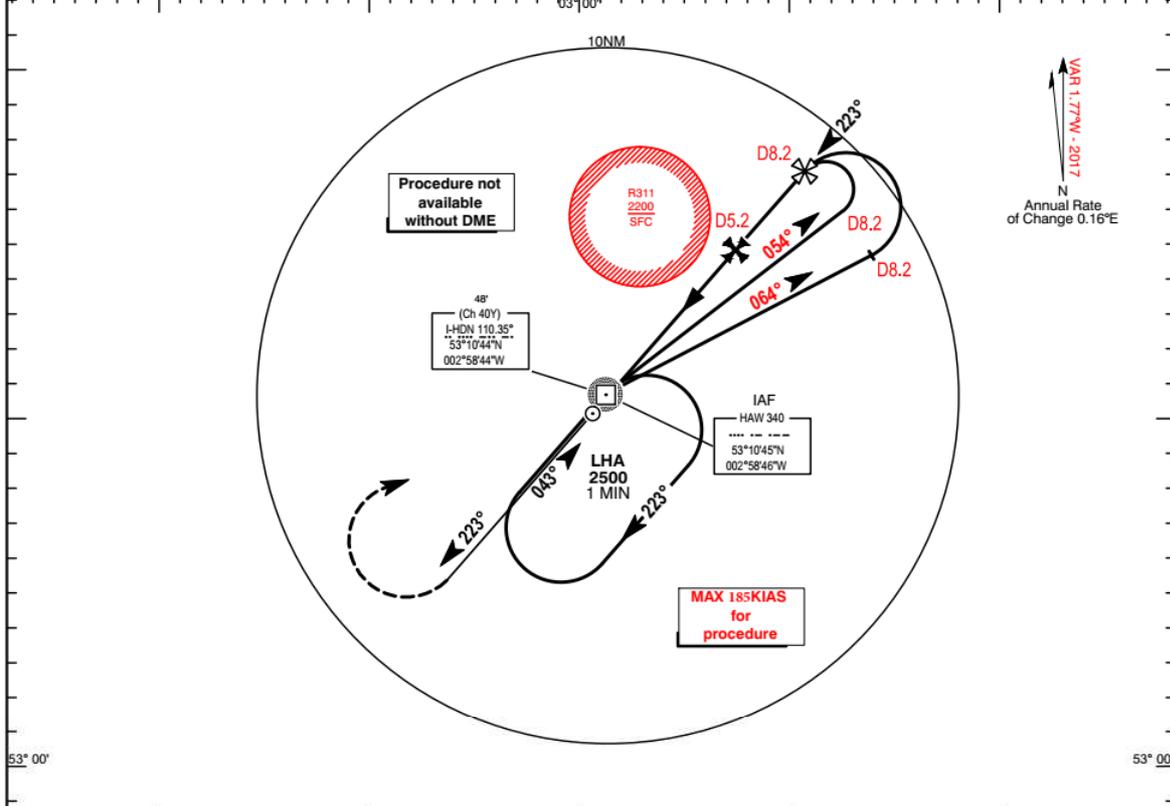
CHANGE: New chart.



**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN  
ILS/DME/NDB(L)  
RWY 22**  
(ACFT CAT A,B,C)

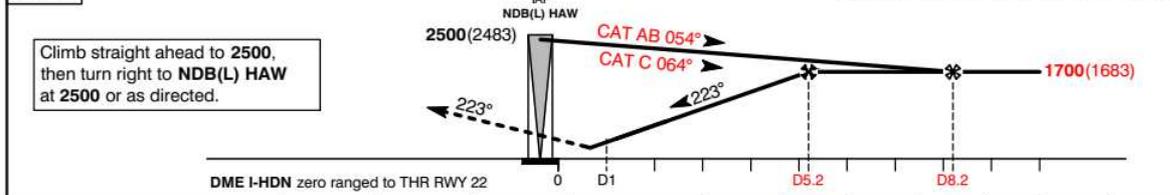
 MSA 25NM NDB(L) HAW	 MSA 10NM NDB(L) HAW	TWR 124.950 HAWARDEN TOWER	AD ELEVATION 45
		RAD 123.350 HAWARDEN RADAR	THR ELEVATION 17
		ATIS 125.425 HAWARDEN INFORMATION	
		BEARINGS ARE MAGNETIC	
		TRANSITION ALTITUDE 5000	



**RECOMMENDED PROFILE GLIDE PATH 3°, 320FT/NM**

DME I-HDN	5	4	3	2	1
ALT (HGT)	1660(1643)	1340(1323)	1020(1003)	710(693)	390(373)

RDH 52 Arrival not below MSA. Shuttle in hold if necessary.



Aircraft Category		A	B	C	Rate of descent					
OCA (OCH)	2.5% climb	380(363)	390(373)	400(383)	G/S KT	160	140	120	100	80
	3% climb	270(253)	280(263)	290(273)	FT/MIN	840	740	630	530	420
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)							
	East of RWY 04/22	700(655)	800(755)	1500(1455)						

**AIRCRAFT UNABLE TO RECEIVE DME I-HDN**  
Advise ATC. Subject to ATC approval, radar ranges will be provided at 8.2NM outbound and at 5.2NM inbound.

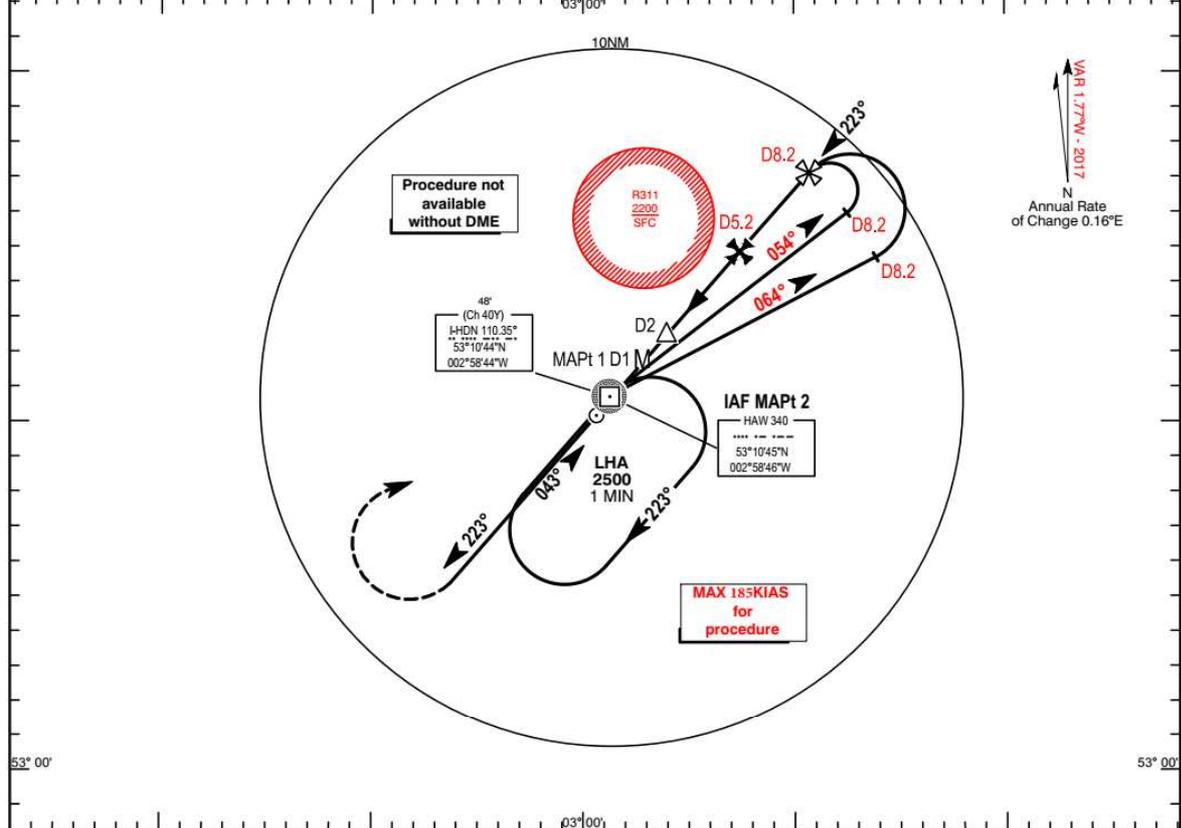
CHANGE: New chart.

Chart created by ASAP s.r.o.

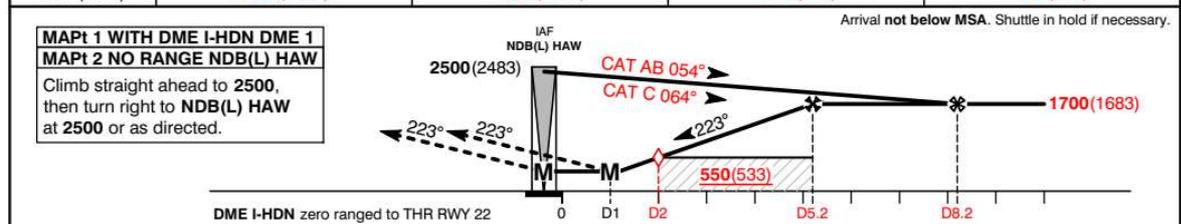
Chart V2.0

**INSTRUMENT APPROACH CHART - ICAO**

 MSA 25NM NDB(L) HAW	 MSA 10NM NDB(L) HAW	TWR 124.950 HAWARDEN TOWER	AD ELEVATION 45	<b>HAWARDEN LOC/DME/NDB(L) RWY 22</b> (ACFT CAT A,B,C)
		RAD 123.350 HAWARDEN RADAR	THR ELEVATION 17	
		ATIS 125.425 HAWARDEN INFORMATION		
		BEARINGS ARE MAGNETIC		TRANSITION ALTITUDE 5000



RECOMMENDED PROFILE Gradient 5.2%, 320FT/NM			
DME I-HDN	5	4	3
ALT (HGT)	1650(1633)	1330(1313)	1010(993)
			2 (SDF)
			700(683)



OCA (OCH)	Aircraft Category	A	B	C	Rate of descent G/S KT FT/MIN	160	140	120	100	80
	With DME	450(433)	450(433)	450(433)		840	740	630	530	420
	Radar range only 2.5% climb	590(573)	590(573)	590(573)						
	Radar range only 4% climb	450(433)	450(433)	450(433)						
VM(C)OCA (OCH AAL)	No DME or radar range	830(813)	830(813)	830(813)						
	Total Area	800(755)	900(855)							
	East of RWY 04/22	700(655)	800(755)	1500(1455)						

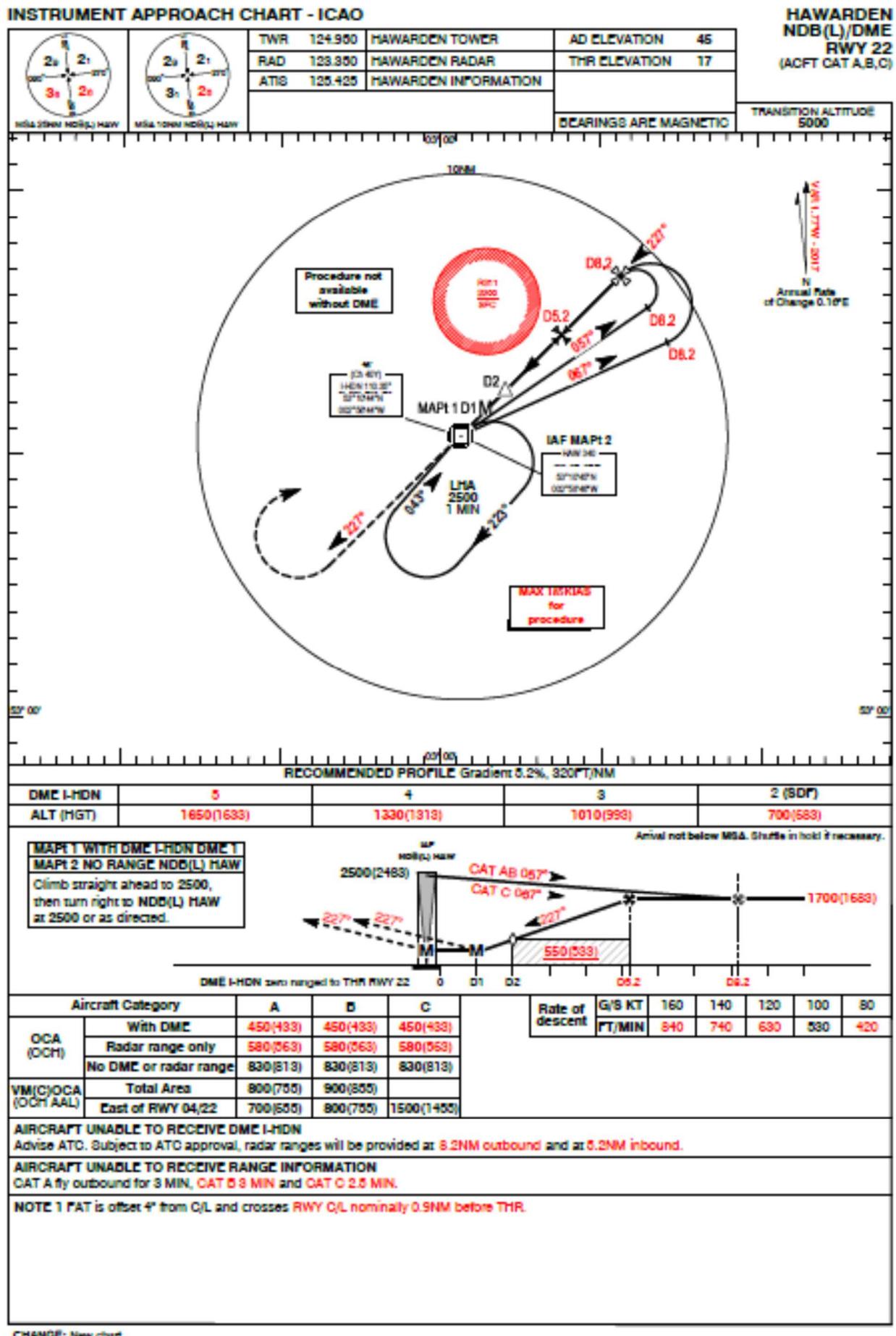
**AIRCRAFT UNABLE TO RECEIVE DME I-HDN**  
Advise ATC. Subject to ATC approval, radar ranges will be provided at 8.2NM outbound and at 5.2NM inbound.

**AIRCRAFT UNABLE TO RECEIVE RANGE INFORMATION**  
CAT A fly outbound for 3 MIN, CAT B 3 MIN and CAT C 2.5 MIN.

CHANGE: New chart.

Chart created by ASAP s.r.o.

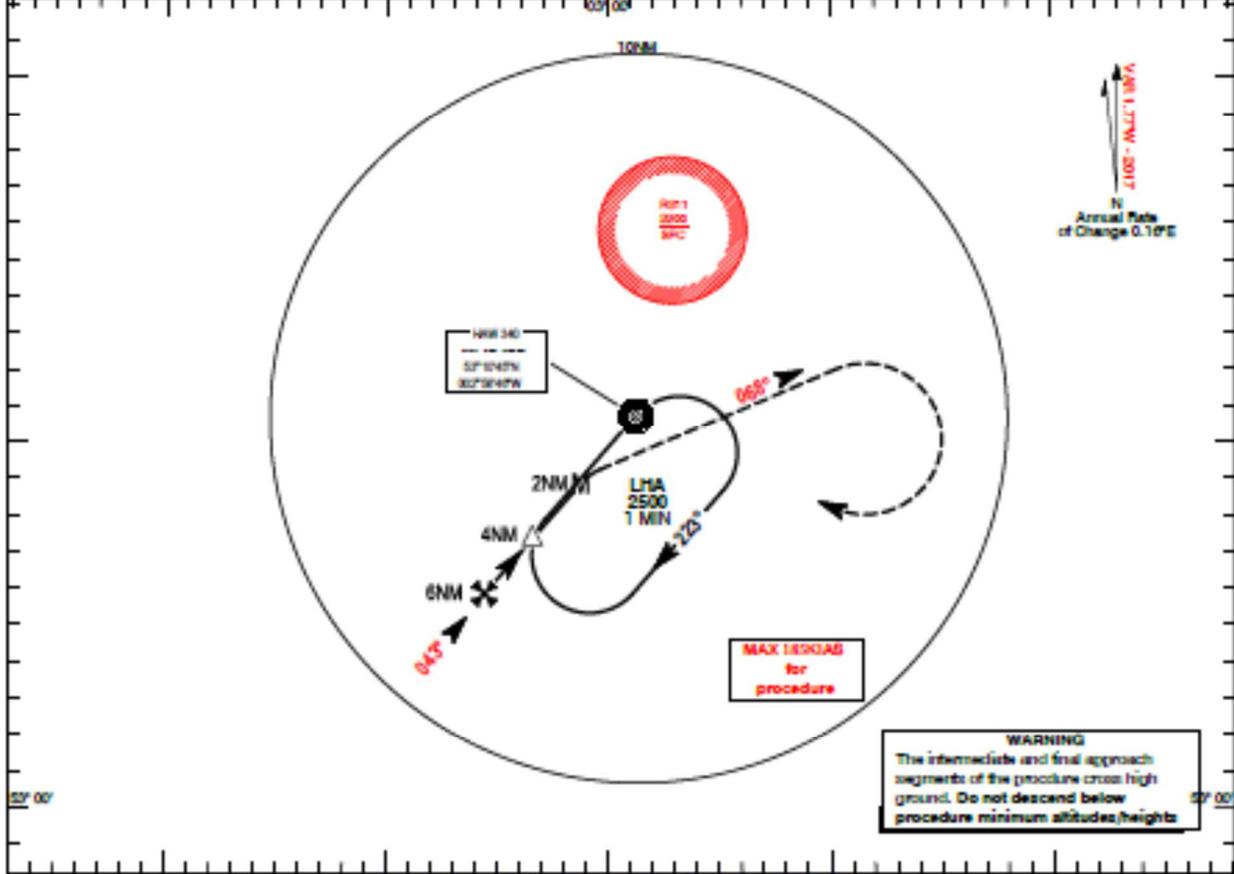
Chart V2.0



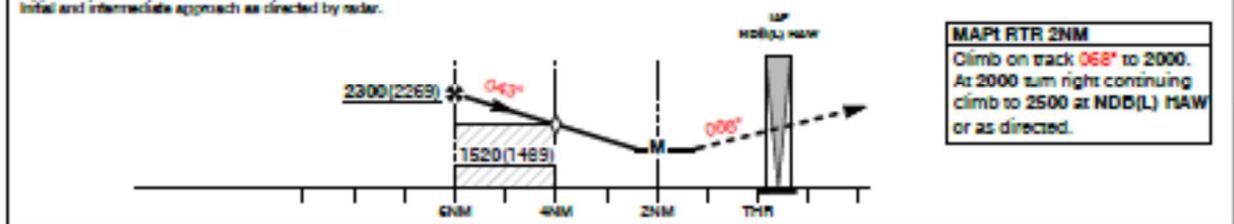
**INSTRUMENT APPROACH CHART - ICAO**

**HAWARDEN**  
SRA RTR 2NM  
RWY 04  
(ACFT CAT A,B,C)

		TWR 124.900 HAWARDEN TOWER	AD ELEVATION 45
		RAD 123.300 HAWARDEN RADAR	THR ELEVATION 31
		ATIS 125.425 HAWARDEN INFORMATION	
			BEARINGS ARE MAGNETIC
			TRANSITION ALTITUDE 5000



RADAR ADVISORY HEIGHTS Gradient 5.1%, 370FT/NM			
NM	5	4 (SDF)	3
ALT(HGT)	1930(1899)	1560(1529)	1190(1159)



Aircraft Category	A	B	C	Rate of descent	G/S KT	160	140	120	100
OCA (OCH) Procedure	960(929)	960(929)	960(929)	FT/MIN	990	860	740	620	
VM(C)OCA (OCH AAL)	Total Area	800(755)	900(855)						
	East of RWY 04/22	700(655)	800(755)	1500(1455)					

CHANGE: New chart.