

IFP Safeguarding

Barr Killoch

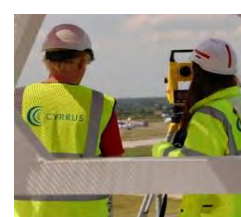
Prestwick Airport

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Introduction

Barr Environmental Ltd (the Client), has requested an Instrument Flight Procedure (IFP) Safeguarding Assessment on a proposed 75m Chimney Stack, associated with the Barr Killoch Waste management site, located approximately 7.18 NM to the South East of Glasgow Prestwick Airport (GPA) as seen below in Figure 1.

The purpose of the Assessment is to determine if the stack infringes any of the protection surfaces of the IFPs serving the GPA. Each IFP type has a different set of criteria that needs to be considered with any penetration potentially impacting the minimum altitude an aircraft may descend to when conducting an approach, or the minimum gradient they must meet on approach, or exceed on departure.

These IFPs are particularly important during adverse weather conditions when flight visibility is reduced as they provide the pilot with assurances that there are no obstacles on the defined flight path. Whilst on the descent, the aircraft reaches a Decision Point at which the pilot must have the required visual references¹, if these references are not visually acquired the pilot must initiate a missed approach; this portion of flight is also protected and is assessed.



Figure 1: Development Distance from ARP

Cyrrus is an Approved Procedure Design Organisation (APDO) as defined by the UK and Irish aviation authorities (Civil Aviation Authority and Irish Aviation Authority). Although Cyrrus is not the APDO for GPA, it is one of eight approved organisations by the UK CAA. As Cyrrus is not the GPA APDO it is required to design the Airport's IFPs from 'first principles' prior to assessing an obstacle; the designs are then validated by the Independent Approved Procedure Designer (IAPD) listed on the Cyrrus CAA certificate. This process ensures that the IFPs are correctly designed, interpreted and comply with the International

¹ Required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

Civil Aviation (ICAO) recommended practices as defined under the IFP Design documentation called the Procedures for Air Navigation Services – Operations (PANS-OPS).

These procedures are standardised under international agreement. The UK is a founding member and signatory to the ICAO Chicago Convention and complies with the stated Standards and Recommended Practices (SARPs) of ICAO. The UK Government captures the ICAO SARPs under the Air Navigation Order (ANO) with the responsibility of regulation of aviation matters delegated to the CAA. The CAA publishes additional policy and regulations under Civil Aviation Publications (CAP), IFP Design is captured under CAP785. As a result of the stringent international rules governing aviation, the process of IFP Design follows clear laid down criteria and is not subject to individual interpretation of design. Any differences in design between organisations will be minor and because of using different software tools. The data collection and usage are governed under CAP1054 (Aeronautical Information Management) and ensure data integrity through the Aeronautical Data Quality Implementing Rule (ADQIR), as such, the data used for design or safeguarding will be official published data available through the Aeronautical Information Publication (AIP).

In safeguarding IFPs, Cyrrus apply additional lateral buffers to assessed obstacles and thereby apply more conservative values than what are used when designing an IFP. By applying this method, Cyrrus will ensure that an obstacle declared as clear of impacting the IFPs is suitably clear and not on any safety margins. Another reason for applying a lateral buffer is as a result of variances that may occur between obstacle design and final build. Vertical buffers are only applied if there is uncertainty in the vertical data. For this assessment, the vertical data is known and the lateral buffer accounts for any terrain differences. The buffer applied for this assessment was 20m and noted under the next section.

Data

List of data received from client:

- 14113 - PL 02 (SITE PLAN).pdf
- Barr Site Feb 21.dwg

The coordinates for the Chimney stack were extracted from the “Barr Site Feb 21.dwg” drawing, prepared by the project architect FOB Design, and converted from OSGB36 Eastings Northing to WGS84 Latitude Longitude using Ordnance Survey GridInQuestII, the ground elevation of the site was extracted from Intermap NEXTMap Britain Digital Terrain Model (DTM) and rounded to the next 10 metres, the resulting assessment parameters for the chimney stack are:

- Easting (OSGB36): 247717.681264
- Northing (OSGB36): 620254.729220
- Latitude (WGS84): 55°27'8.6121"N
- Longitude (WGS84): 4°24'34.0810"W
- Ground Elevation (m AMSL): 160
- Height (m AGL): 75
- Lateral assessment radius (m): 20

Assessment

An IFP Safeguarding assessment was completed against the applicable procedures for Runway 12/30 and 03/21 at GPA. All procedures are assessed and includes the Missed Approach Procedure (MAP) of each Instrument Approach Procedure (IAP). Due to the technical nature of the information, this report is a distillation of the IFP modelling and subsequent assessment of the obstacles, the full data set is available if required².

The purpose of this report is to identify what procedures were assessed and whether there is an impact, in the event of an impact, potential mitigation is provided³.

Table 1 provides the summary of all the IFPs assessed.

Assessed Procedure	Runway	Impact	Comments
ATC SURVEILLANCE MINIMUM ALTITUDE CHART	All	No	Nil
MSA 25NM NDB(L) PIK		No	Nil
RNAV5 ARRIVAL (STAR) BLACA 1P		No	Outside Obstacle Protection Areas
RNAV5 ARRIVAL (STAR) APPLE 2P RIBEL 2P		No	Nil
RNAV1 DEPARTURE (SID) LUCCO 1K SUDBY 1L SUMIN 1L	30, 12	No	Nil
RNAV1 DEPARTURE (SID) TRN 2K 2L DAUNT 1K OKNOB 1L		No	Nil
RNAV1 TRANSITION TRN 2Q	12	No	Outside Obstacle Protection Areas
ILS/DME/NDB(L)		No	Nil
LOC/DME/NDB(L)		No	Nil
SRA RTR 2 NM		No	Nil
RNP		No	Nil
NDB(L)/DME		No	Nil
RNAV1 TRANSITION TRN 2S SUMIN 2S	21	No	Nil
SRA RTR 2NM		No	Nil
RNP		No	Nil
NDB(L)/DME		No	Nil

² Please note that the full data set normally runs in excess of 50 pages per procedure and can only be decoded by those familiar with the output generation from the IFP Software and trained IFP Designers.

³ Mitigation for the IFPs is for the Airport to decide upon as these may have a direct impact on their operations.

Assessed Procedure	Runway	Impact	Comments
RNAV1 TRANSITION TRN 2R SUMIN 2R	30	No	Outside Obstacle Protection Areas
ILS/DME/NDB(L)		No	Nil
ILS/DME/NDB(L) SHORT PROCEDURE		No	Nil
LOC/DME/NDB(L)		No	Nil
LOC/DME/NDB(L) SHORT PROCEDURE		No	Nil
SRA RTR 2NM		No	Nil
RNP		No	Nil
NDB(L)/DME		No	Nil

Table 1: Summary of Assessed Procedures

Conclusion

The Chimney stack has no impact on the published IFPs for Glasgow Prestwick Airport.



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