OSPREY
CONSULTING SERVICES

Full Options Appraisal

St Athan ILS ACP Step 3A

Date: 13th September 2019
Author:
Revision: Issue 1
Osprey Ref: 71322 011

The Hub, Fowler Avenue, Farnborough Business Park, Farnborough, GU14 7JP
01420 520200 / enquiries@ospreycsl.co.uk
Registered in England and Wales under No: 06034579

Document Details

Reference	Description
Document Title	Full Options Appraisal
	St Athan ILS ACP Stage 3A
Document Ref	71322 011
Issue	Issue 1
Date	13th September 2019
Client Name	Welsh Government Aviation Team
Classification	Commercial in Confidence

Issue	Amendment	Date
Issue 1	First formal issue	13th September 2019

Approval Level	Authority	Name
Author	Osprey CSL	
Reviewer	Osprey CSL	

Table of Contents

1 Introduction

For Stage 3A, CAP 1616 requires sponsors to complete a Full Options Appraisal that assesses the benefits of the various options compared to a baseline. As the sole aim of the proposal is to publish the St Athan ILS procedures, which until 31st March 2019 were published in the Mil AIP, in the UK AIP, there are limited options available. Nevertheless, this appraisal considers the options and compares a baseline of returning to the pre-31st March 2019 situation against 'do nothing', that is, the permanent withdrawal of ILS procedures.

1.1 Background - a Scaled CAP 1616 Airspace Change Process

This document forms part of the set required to meet the requirements of the CAP 1616 airspace change process and aims to satisfy the Stage 3 Consult Gateway, Step 3A Full Options Appraisal. The CAA Airspace Regulation Department has agreed[1] to a scaled ACP submission for this proposal. At a combined 'Define' and 'Develop & Assess' Gateway the CAA assessed the level for the airspace change as Level 2C, which typically does not alter traffic patterns below 7,000 feet (above mean sea level).

The sole aim of this proposal is to enable the publication of the existing CAA-approved St Athan ILS procedures, previously published in the Mil AIP, in the UK AIP. The proposal does not alter traffic patterns below 7,000 feet. The primary users of ILS procedures are commercial aircraft arriving to use St Athan's Maintenance Repair and Overhaul (MRO) facilities. Although they comprise only around 1% of St Athan's annual movements, aircraft for MRO have a disproportionately positive economic impact on the airport and the surrounding area of South Wales.

Step 3A requires the change sponsor to carry out a Full Options Appraisal and CAP 1616 states this must be carried out with 'with more rigorous evidence for its chosen option(s)' than was the case for Step 2B, the Initial Options Appraisal. Although one technical option and several process/procedural options were considered, all were subsequently rejected, as described in paragraph 1.2 below.

The nature of the proposal dictates that there is limited scope for a more detailed appraisal than was conducted for Step 2B; that said, where this has been possible it has been completed. The baseline for comparison is the arrangements that existed up to 31st March 2019, when the ILS procedures were published in the Mil AIP. The baseline is compared with the change proposal - publication of the ILS procedures in the UK AIP – and against the 'do nothing' option, which is the permanent withdrawal of ILS procedures at St Athan. There is no benefit to be gained in considering the impact of the change during the intervening period as seasonal changes in traffic have masked any variation.

[1] Email S Garner (CAA) to A Judge (Osprey) RE: 71299 - St Athan ILS Procedures ACP-2018-35 (sent 13:18 on Fri 14/06/2019)

1.2 Consideration of potential impacts

As described in earlier submissions, although there is no change to the ILS procedure, airspace design and associated operational procedures, or to the expected number and type of aircraft movements, the sponsor seeks to ensure that, while the process may be scaled in a proportionate manner, its application remains true to the spirit and objectives of CAP 1616; these will be explored below.

While it would be inappropriate to speculate on the scale of any potential future impacts, there are indications to suggest that, as season traffic levels increase and weather conditions generally deteriorate, the impact of the current lack of an ILS procedure may increase during the winter period.

1.2.1 Ensuring any potential impact is fully understood

Step 2A, Options Development, tested the proposal against CAP 1616 Appendix F to confirm any potential impact of the proposal was fully understood. At Step 2B, Initial Options Appraisal, the proposal was tested against CAP 1616 Appendix E, Table E2, which confirmed that the proposal has negligible impact on all stakeholders. This analysis has been updated at Annex A1, to take account of additional information and feedback gained during initial stakeholder engagement activities.

1.2.2 Any potential impact on safety has been considered

As the proposal makes no changes to ATC or aircraft procedures, it is accepted that there are no safety impacts associated with it. In the 'do nothing' option there is anecdotal evidence that suggests an increase in controller workload in vectoring aircraft for a visual approach at St Athan, but this does not constitute a new hazard or an additional risk that has not already been identified in Step 2A.

1.2.3 Any potential impact on airspace has been considered

As has subsequently been recognised by the CAA in the classification of the change as Level 2C, which does not alter traffic patterns below 7,000 feet, Step 2A demonstrated that the proposal would not lead to any change in airspace layout, design, classification, or to route structures.

1.2.4 Any potential operational impacts have been considered

Earlier analysis confirmed that the proposal introduces no change to the ILS procedures' track or slope, or to the number or type of aircraft movements, ATC procedures or ATCO workload and these factors have therefore not been assessed individually. Similarly, there would be no impact on other airspace users including IFR general air traffic, operational air traffic or VFR General Aviation (GA), or on procedures or capacity at adjacent airports. Neither would there be an impact on supporting infrastructure or resources.

1.2.5 Any potential environmental impacts have been considered

As the sponsor assesses that no environmental change results from the proposal and there would be no change for people on the ground, assessments of noise impacts, CO2 emissions, local air quality and tranquillity have not been conducted. The rationale for this was covered in detail in Osprey Document 71322 004 dated 5th August 2019. Furthermore, during initial engagement meetings, both NATS Cardiff and SERCO confirmed that even in the 'do nothing' scenario aircraft that would

previously have flown an ILS procedure, instead fly a straight-in visual approach. These aircraft follow a very similar track and descend to the same altitude as they would if flying an ILS procedure, that is, 2,400 feet. The only difference is that, when it was available, aircraft flying an ILS procedure were able to continue their descent to a Decision Height of 510/520 feet (depending which procedure was being flown).

1.2.6 Any potential economic impacts have been considered

With an average of 12,551 movements per year over the 5-year period 2014-18 (inclusive), aircraft movements at St Athan are low by comparison to many other airports.

Categorised by type of operation, these movements comprise:

- University of Wales Air Squadron (UWAS);
- Maintenance Repair and Overhaul (MRO);
- General Aviation (GA);
- Military;
- Helicopters (Heli) – combining Bristow Search and Rescue and National Police Aviation Services.

Table 1 below shows the movement statistics by type over the period.

Year	UWAS	MRO	GA	Military	Heli	TOTAL
2014	5,106	93	1,573	1,025	3,280	11,077
	46.1%	0.8%	14.2%	9.3%	29.6%	100%
2015	4,852	118	1,815	791	571	8,147
	59.6%	1.4%	22.3%	9.7%	7.0%	100%
2016	7,302	110	4,621	750	2,532	15,315
	47.7%	0.7%	30.2%	4.9%	16.5%	100%
2017	7,464	41	4,670	659	2,200	15,034
	49.6%	0.3%	31.1%	4.4%	14.6%	100%
2018	7,385	117	3,651	201	1,830	13,184
	56.0%	0.9%	27.7%	1.5%	13.9%	100%
Average	**6,422**	**96**	**3,266**	**685**	**2,083**	**12,551**
Average %	**51.8%**	**0.8%**	**25.1%**	**6.0%**	**16.3%**	**100%**

Table 1 Aircraft Movement Statistics at St Athan

Although MRO aircraft arrivals only comprise around 1% of St Athan's annual movements, they are essential to the continuing economic viability of the MRO businesses; the importance of MRO operations to the airport, is disproportionately high. Aircraft using MRO facilities at St Athan tend to be of the A320 and B737 type, operated by AOC-holding airlines such as TUI and ASL Airlines France. These operations form the predominant revenue stream for the airport, part of the St Athan – Cardiff Airport Aerospace Enterprise Zone. The 'do nothing' scenario and unavailability of ILS procedures means that aircraft are unable to land at St Athan if the cloud base is below 2,400 feet.

As the table and graph below illustrate, there has been little difference in the small number of aircraft movements to the MRO facilities since 1 April 2019 when compared with the same period over the previous 5 years. Furthermore, less aircraft maintenance is conducted over the summer months and therefore fewer aircraft arrive at St Athan for MRO services during this period. This makes a statistically meaningful assessment of the environmental or economic impact between the proposed option and 'do nothing' impractical. However, since the suspension of the ILS procedures some airlines have sent their aircraft to different destinations, resulting in a significant loss of revenue for the MRO companies.

	2019	2018	2017	2016	2015	2014	Mean
Apr	13	5	6	22	11	2	9.8
May	7	5	5	3	12	6	6.3
Jun	3	0	0	11	14	18	7.7
Jul	4	5	2	5	4	5	4.2
Aug	5	4	1	4	6	5	4.0
Total	32	19	14	45	47	36	32.2

Table 2 MRO aircraft movements at St Athan April-June 2014-19

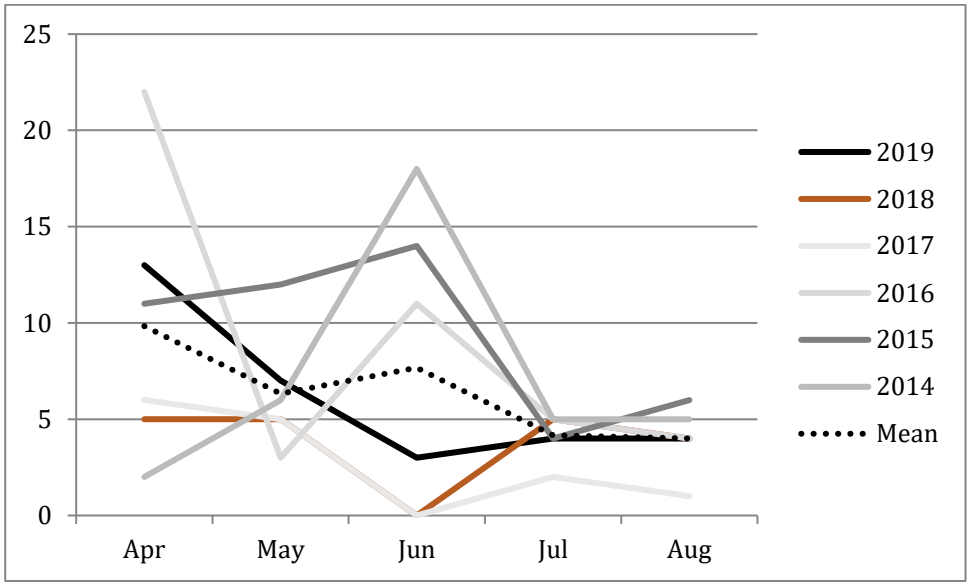

Figure 1 Graph showing MRO aircraft movements at St Athan April-June 2014-19

The unavailability of the ILS makes scheduling of maintenance flights to St Athan more difficult in the short term as good forecast weather is essential. In the longer term, the additional uncertainty of operating to a VFR-only airport may make the airport less attractive to airlines as an MRO destination.

1.3 Appraisal of Potential Options

Five potential options to address the removal of the St Athan ILS procedures from the Mil AIP have been considered and no radical options were identified:

1.3.1 Permanently withdraw the ILS

The permanent withdrawal of the ILS procedures, recognised in this appraisal as the 'do nothing' option, is discounted because it does not meet the SoN and is considered disproportionate. The ILS equipment remains serviceable and, when published in the UK AIP, would be available to all operators at St Athan, most importantly MRO customers. If withdrawn permanently, St Athan would have no instrument approach procedures. MRO customers have indicated that they would be less likely to operate to St Athan if it were a VFR-only airport, because of the increased risk of aircraft being diverted and the additional requirement for exemptions from their AOC holder for visual-only approaches. For example, TUI stated that, "when flying to an airport with no instrument approach, such as St Athan, we require the authorisation of the AOC holder (Director of flight operations, or their nominated deputy)".

Although non-compliant, as the worst case scenario, the 'do nothing' option has been taken forward purely for comparative purposes.

1.3.2 Introduce RNAV procedure instead of ILS through a full Level 1 airspace change application

The introduction of RNAV procedures instead of ILS was considered but rejected because the ILS is already in situ and the introduction of RNAV procedures would involve a lengthy, expensive change application that the sponsor considers would be

disproportionate. RNAV procedures would necessitate a change in aircraft heights and tracks over the ground and have a potentially significant impact on all stakeholders. In addition, aircraft being delivered to St Athan for recycling may not be able to fly RNAV approaches and end-of-lease aircraft often need to use the ILS for flight test and demonstration flights.

This option is considered disproportionate, does not fulfil the SoN, introduces new project issues and risks and changes the environmental impact; it has not been taken forward.

1.3.3 Publish the ILS procedures in the UK AIP as a Level 0 change

This option has been discounted by the CAA as the proposal is greater than a change in nomenclature to the UK AIP.

This option has not been taken forward.

1.3.4 Publish the ILS procedures in the UK AIP following a full, conventional Level 1 CAP 1616 process

This option was discounted as it would be too lengthy, costly and disproportionate in meeting the SoN. The sponsor would have difficulty justifying the expenditure to conduct a full application as there is no change to the procedures.

The CAA has agreed to a scaled approach for the proposal and assessed the change as Level 2C.

1.3.5 Publish the ILS procedures in the UK AIP following a scaled, proportionate and accelerated application of CAP 1616

Publish the ILS procedures in the UK AIP following a scaled, proportionate and accelerated application of CAP 1616.

This is the sponsor's preferred option and the approach has been agreed by the CAA in its assessment that this is a Level 2C change.

2 Full Options Appraisal

2.1 Introduction

The Initial Options Appraisal, Step 2B, identified the publication of the Athan ILS procedures in the UK AIP as the only viable option that meets the SoN. This situation has not changed and here the single option is appraised against 'do nothing', the permanent withdrawal of ILS procedures from St Athan, which is seen as the only realistic alternative. This appraisal demonstrates the minor nature of the proposal and its negligible impact on all stakeholders, while illustrating the negative operational and, particularly economic, impacts of 'do nothing'. In this analysis, the baseline is the scenario that existed prior to 31st March 2019 when the ILS procedures were published in the Mil AIP, rather than the baseline being the 'do nothing' option.

Following the Initial Options Appraisal, this Full Appraisal is proportionate and a straightforward comparison of the impacts of the two options, publish the procedures in the UK AIP and 'do nothing'. As confirmed by ANSPs, the aircraft tracks flown for an ILS procedure and a visual approach are near identical, no environmental impacts have been identified in relation to noise, CO2 emissions or local air quality. Similarly, there is insufficient empirical data available from aircraft movement numbers since 1st April 2019 to identify trends to support an economic impact assessment or to monetise the potential impact of either implementing the proposal or 'do nothing'.

Therefore, whilst complying with the spirit of CAP 1616 and The Green Book[2], the Department for Transport's WebTAG[3] analysis guidance has not been employed. Nevertheless, the St Athan-based MRO companies and their airline customers have provided statements that confirm the negative economic impact of the withdrawal of the ILS, in both the short and longer term.

The analysis that follows re-works the Step 2B submission to include new information gathered from initial stakeholder engagement, including from airline customers of the MRO facilities. It summarises Annex 1 comparing 'do nothing' against the publication of the ILS procedures in the UK AIP.

2.2 Baseline

ILS procedures were withdrawn when St Athan transferred from Military Aviation Authority (MAA) oversight to CAA oversight on 31st March 2019 and there are currently no instrument approach procedures available at the airport. The baseline

[2] The Green Book: Appraisal and Evaluation in Central Government; https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government

[3] DfT transport analysis guidance WebTAG: https://www.gov.uk/guidance/transport-analysis-guidance-webtag

for this proposal is the pre-1st April 2019 situation, where ILS procedures were available.

2.3 Current Noise Impact for Communities

The vast majority of MRO movements used the ILS when it was available, but over the last 5 years they consistently represented only 1% of St Athan movements. Table 1 and Figure 1 illustrate that in the 4 months since the ILS procedures have been withdrawn it has not been possible to identify significant trends in aircraft movements in order to make a meaningful assessment of whether the noise impact for communities has changed. Evidence from meetings with Cardiff NATS and Serco confirm that aircraft flying visual approaches to St Athan fly near-identical profiles to those that flew an ILS procedure, being positioned at 10 nm finals for a straight-in approach to land. However, to maintain continuous descent when flying VFR without ILS glidepath information, pilots may need to more frequently alter their engine power settings, which could result in a negligible increase in the local noise impact in the absence of ILS procedures.

It is therefore argued that the current noise impact experienced by communities for such a small number of aircraft (and due to seasonal variations in traffic levels) has been unchanged by the withdrawal of the ILS procedures and would be unchanged by the re-introduction of the ILS.

As there is no change to the track or slope of the procedures proposed for publication in the UK AIP, nor to the type of aircraft or frequency of aircraft movements, if the proposal is approved, the current noise impact would remain at historic norms.

2.4 Air Quality and Emissions

To maintain continuous descent when flying VFR without ILS glidepath information pilots may need to more frequently alter their engine power settings below 1000 ft (the threshold for air quality measurements) with an associated increase in fuel burn. This may have a potential minor adverse impact on air quality and emissions, although this assumption has not been proved. Conversely, if the proposal is approved, as there is no change in the track or slope from the procedure published in Mil AIP, aircraft will be flying more consistent approach paths and there will be no change to air quality compared to before the ILS procedure was withdrawn.

2.5 Capacity and Resilience

There are no plans to increase airport capacity at St Athan, although both MRO operators have concerns that without the availability of ILS procedures at St Athan, demand for their services may diminish. The aim of the proposal is therefore to help sustain, rather than to enhance demand for MRO facilities at St Athan.

2.6 GA Access

There would be no identifiable impact to GA aircraft arrivals, departures and transits of the local area associated with the re-introduction of ILS procedures at St Athan. All GA movements that transit the Cardiff CTR and CTA are positively controlled and

managed by Cardiff ATC. ANSPs have confirmed that in the current 'do nothing' scenario MRO aircraft inbound to St Athan fly visual approaches that have a very similar profile to ILS approaches, so neither scenario will have an impact on GA aircraft. Furthermore, there is no plan to change the way GA aircraft operate to and from St Athan. No changes are proposed to the parameters of the current airspace and therefore no change to airspace access is predicted.

2.7 Economic Impact: GA, Commercial Airlines and MRO

For the reasons identified in Section 2.6 above, there is no predicted economic impact on GA of either 'do nothing' or the preferred solution.

If the procedures are permanently withdrawn and commercial airlines are obliged to operate VFR, there may be an increase in the number of aircraft who will be forced to divert in poor visibility conditions. This would generate additional costs for these airlines for example for fuel, handling fees, hotels, transport, re-booking crew return journeys. In addition, crew scheduling would also be impacted.

Furthermore, in their highly competitive market, MRO operators based at St Athan have major concerns that the permanent withdrawal of the ILS procedures will have a significant long-term negative impact on the attractiveness of their businesses, which could have a significant impact on the local economy.

[MRO Company] commented that some [international] airlines are especially conscious of any additional risk to their brand reputation and are not prepared to fly to VFR-only airports. Since April 2019, one airline has taken its business to a MRO in Spain rather than use St Athan, resulting in lost revenue in the region of c£[value] per aircraft, totalling c£[value].

For [MRO Company], whose business model is different, lost revenue is more difficult to estimate. They can host up to [number] medium-sized (e.g. B737) aircraft at any one time. Maintenance tasks vary from an engine change, which costs in the region of £[value] per engine and takes 24-48 hrs, to a full 'heavy' C-check which could cost up to £[value] and take [number] days. The impact on revenue of the decision not to use St Athan can therefore vary significantly between aircraft. [MRO Company] accept that the unavailability of the ILS may not be the sole reason that an airline chooses to take its business elsewhere but, as all airlines work to very demanding schedules, the increased uncertainty of VFR-only operations is a definite contributory factor.

Airlines such as [airline]have been deterred from contracting for a full winter 2019 maintenance programme with [MRO Company] because of the uncertainty posed by VFR-only approaches available at St Athan. Depending on the type of maintenance required this loss of revenue could amount to several hundreds of thousands of pounds. In the longer-term, [MRO Company] report that the availability, or not, of the ILS is a question that continually surfaces in relation to future investment decisions for the company.

As further evidence, [another airline] commented that the lack of ILS could affect airline's choice of MRO for routine maintenance as fleet maintenance schedules are planned months in advance saying, "An ILS is a huge benefit to operational stability that could affect customers' choice of MRO". [Airline] also have a significant fleet roll-over which requires that the MRO chosen for end-of-lease is also acceptable to

the Lessor of the aircraft – without ILS this could put significant risk into the use of St Athan-based MROs for such projects.

If procedures are published in the UK AIP, there will be no change and the airport will continue to be an attractive proposition to existing and potential future MRO customers.

2.8 Fuel Burn: GA and Commercial Airlines

There is no predicted impact on fuel burn for GA from either 'do nothing' or the preferred solution.

For commercial airlines, fuel burn may be marginally higher if the ILS is permanently withdrawn due to the increased unpredictability of aircraft tracks when flown VFR and the increased risk of aircraft being forced to divert if unable to complete a VFR approach.

Conversely, although fuel burn may be lower at St Athan if airlines decide not to use its facilities, their aircraft will still need to be delivered to another MRO unit for maintenance, and with the limited data available it is not possible to calculate this impact.

If ILS procedures are published, there will be no change in fuel burn for either GA or commercial airlines.

2.9 Infrastructure Costs

This assessment has not changed since the Initial Appraisal, if ILS procedures are permanently withdrawn, the ILS equipment would be decommissioned, with the associated costs. This would also represent poor value for money to Welsh taxpayers as the equipment will have not provided maximum return on the investment made by the Welsh Government for its introduction. If the proposal is approved, the only infrastructure costs would be for planned routine maintenance of the ILS equipment.

2.10 Operational Costs

Internal airline procedures dictate the requirement for instrument procedures such as ILS to be available and this varies between airlines. Similarly, some airlines have different requirements for passenger and non-passenger flights, normally based on a risk assessment carried out by the airline itself. Neither [airline] nor [airline] routinely permit operations to aerodromes without instrument approach procedures and to do so both require an exemption from the AOC holder (Director of flight operations, or their nominated deputy). Airlines report that meteorological forecasts for St Athan often vary considerably over a day, making it difficult to predict whether a VFR landing will be possible. Currently the Minimum Safe Altitude an aircraft can descend to without the ILS is 2400 ft. With ILS procedures available airlines could fly approaches to St Athan with a cloud base as low as 510 ft.

If ILS procedures are withdrawn and commercial aircraft are obliged to fly visual approaches, operations will be more vulnerable to poor weather and there is an increased likelihood of aircraft diverting, with airlines incurring additional costs. [Airline] commented that the impacts of the suspension of the ILS procedures at St

Athan had meant more pre-flight planning, greater uncertainty and potential disruption because of the increased relevance of the forecast weather and the additional burden of selecting appropriately-trained crew for these specific flights. Airlines need to have confidence that, when an aircraft is booked in for maintenance, it will be able to arrive at the MRO on time and be able to leave as soon as possible once the work is completed. Without the means to be able to land in poor weather airlines cannot have confidence that this will be achieved. For example, a delay of even one day results in a corresponding delay in the airline's maintenance schedule.

Operators who use St Athan MRO facilities stated that the unavailability of ILS procedures, together with an increased risk of diversion, raises questions about the future viability of the airport for MRO. For example, [MRO Customer] operate many aircraft types globally on behalf of the owners and lessors of aircraft and St Athan has been an important facility for them for end-of-life and storage. They commented that if an aircraft scheduled for maintenance is unable to complete a visual approach and is forced to divert, its technical status may be compromised, meaning it cannot be flown again until costly maintenance activity has been completed. Delays in scheduling while awaiting good weather, to mitigate the risk of such diversion, has discouraged owners from using St Athan, who have instead used maintenance facilities elsewhere.

Another key issue identified by [Airline] was the requirement for an ILS for flight tests and demonstration flights. Without ILS procedures at St Athan, these flights would have to be undertaken at other airports, adding significant planning complications. This could affect their choice of St Athan as their end-of-lease MRO facility.

There may also be additional marginal costs associated with the increased workload and reduced capacity of NATS Cardiff ATCOs providing radar-vectors to aircraft inbound to St Athan, although this is not thought to be significant. If the proposal is approved, there will be no additional operational costs.

2.11 Training Costs

No additional training costs are anticipated for either 'no nothing' or if the proposal is approved, although commercial pilots may be unfamiliar flying visual approaches and, if approved, pilots will need to be made aware of the newly published procedures.

2.12 Other Costs

No other costs have been identified.

2.13 Safety Assessment

The safety assessment has not changed since the Initial Appraisal; its primary conclusions are as follows:

- It is a key assumption that the ILS procedures previously published in the Mil AIP were safe.
- Commercial pilots landing at St Athan to utilise MRO facilities would be competent to operate VFR. However, Commercial Air Transport operations

are routinely based on IFR operations; VFR operations may well be less familiar to them thereby resulting in an unquantifiable level of additional risk.

- Providing radar vectors to commercial aircraft for a visual approach at St Athan is a non-standard procedure and more intense than providing vectors to intercept the ILS localiser; this places greater pressure on air traffic controllers and aircrew.
- The increased unpredictability of large aircraft operating in the Cardiff CTR/CTA, but not flying a published procedure, will also incur some additional risk.

In conclusion, as it relies on so many unquantifiable factors, the level of additional risk associated with the removal of ILS procedures cannot be accurately predicted. That said, there is sufficient anecdotal evidence that would support an assessment of a general increase in risk. Whilst it could not be considered that such an increase would reach an unsafe level, it has appeared already to cross the threshold of risk tolerability to some operators. Equally, re-instatement of the ILS would allow all of the risks identified in the safety assessment to be managed in an established and proven manner.

3 Conclusion

CAP 1616 requires sponsors to complete a Full Appraisal that assesses the benefits of the various options compared to a baseline. Previous submissions, augmented by initial stakeholder engagement, reduced the number of design options to two: publication of the ILS procedures in the UK AIP and 'do nothing'. The analysis illustrates clearly that the proposal has a negligible impact on all stakeholders, whether they be other airspace users, ANSPs or people on the ground; indeed, the greatest impact is associated with the 'do nothing' option. Equally, although the permanent withdrawal of ILS procedures will have a marginal negative impact on most stakeholders, their withdrawal is already having an economic impact on MRO businesses.

Publication of the ILS procedures will allow the number of commercial aircraft landing at the airport to be sustained. 'Do nothing' would see the permanent withdrawal of St Athan's ILS procedures, making visual approaches the sole means of landing at St Athan. This would make operations to the airport less predictable and therefore less attractive to MRO airline customers and will have a potentially significant negative financial impact on its long-term viability.

A1 High Level Objectives and Assessment Criteria

Group	Impact	Option 1: Permanently withdraw St Athan ILS procedures	Option 2: Publish St Athan ILS Procedures in UK AIP
Communities	Noise impact on health and quality of life	There is a small likelihood of a wider dispersal of noise due to lower track predictability, although ATC vector large aircraft for visual approach to the same position (10 nm finals) as they would for ILS. Pilots will not be flying with reference to the localiser that provides lateral course guidance; ATCOs may vary the radar vectors they provide; Pilots will be flying VFR and may fly a different track over the ground in comparison to the ILS localiser.	As there is no change of the ground track from the procedures published in Mil AIP, and therefore experienced by those on the ground, there will be no change to noise impact. The relatively small number of aircraft movements (117 in 2018) and the fact that this ACP is not intended to increase capacity, but rather to sustain MRO operations, is relevant when considering environmental factors.
Communities	Air Quality	When flying VFR without ILS glidepath information, to maintain continuous descent, pilots may need to alter their engine power settings below 1000 ft (threshold for air quality measurements) with an associated marginal increase in fuel burn, which may potentially have an adverse impact.	As there is no change proposed to the track or slope from the procedure published in Mil AIP, there will be no change to air quality as a result of aircraft flying the procedures. The relatively small number of aircraft movements (117 in 2018) and the fact that this ACP is not intended to increase capacity but rather to sustain MRO operations, is relevant when considering environmental factors.
Wider Society	Greenhouse Gas impact	To maintain continuous descent when flying VFR without ILS glidepath information, pilots may need to alter their engine power	As there is no change proposed to the procedures published in the Mil AIP, there will be no change to current greenhouse gas

		settings in the vicinity of the airport, with a possible increase in fuel burn, which may potentially have an adverse impact.	emissions. The relatively small number of aircraft movements (117 in 2018) and the fact that this ACP is not intended to increase capacity but rather to sustain MRO operations, is relevant when considering environmental factors.
Wider Society	Capacity and resilience	There would be no impact on overall UK airspace infrastructure. Resilience and capacity of St Athan and Cardiff airport may be marginally affected if radar vectoring is used, as there is anecdotal evidence of a small increase in ATCO workload versus the predictability of the previously published procedure.	No impact on overall UK airspace infrastructure. Resilience of St Athan and Cardiff ATS returns to the pre-1 April 2019 situation.
General Aviation	Access	No change to existing airspace arrangements. GA users of St Athan will continue to arrive, depart and transit local airspace under extant operational arrangements and under the control of Cardiff ATC. There is a potential small impact due to the increased unpredictability of the tracks of large aircraft inbound to St Athan as they will be flying VFR, rather than IFR.	No change to existing airspace arrangements. GA users of St Athan will continue to arrive, depart and transit the airspace under extant operational arrangements and ILS flights will be wholly predictable. Both GA and ILS traffic will be under the control of Cardiff Airport ATC.
General Aviation / commercial airlines	Economic impact from increased effective capacity	No increase to effective capacity is planned, therefore there is no economic benefit for GA/airlines/other users of the airport. Airlines often do not permit operations to aerodromes without instrument approach procedures and some require exemptions to do so from the AOC holder. If commercial	Effective capacity and economic viability of the airport is maintained for the life of the ILS equipment at St Athan. The attractiveness of St Athan as a MRO facility is enhanced because airlines do not require internal dispensations to fly visual approaches

		aircraft are obliged to fly visual approaches, operations will be more vulnerable to poor weather and there is an increased likelihood of aircraft diverting, with airlines incurring additional costs. This has adverse economic impact on the resilience of those businesses, together with a negative reputational impact on both them and the airport. The attractiveness of St Athan as a potential MRO facility is significantly diminished if the ILS is withdrawn.	and are able to plan their maintenance schedules with confidence in the knowledge that ILS procedures will be available. The MRO facilities are able to compete for business unhindered by the lack of ILS procedures at St Athan. The significance of the economic benefits to the Cardiff Airport-St Athan Enterprise Zone in this area of south Wales are important.
General Aviation / commercial airlines	Fuel burn	Fuel burn will be less predictable and possibly marginally greater as aircraft will be flying VFR; tactical ATC intervention, unsupported continuous descent and an exact route is dependent on pilot and ATC coordination, rather than the ILS procedure.	No change to fuel burn, as no change to procedure track or slopes.
Commercial airlines	Training costs	No additional training is predicted, although commercial airline pilots may have limited experience of flying VFR and may require an exemption from the AOC holder to fly a visual-only approach.	Minimal routine training for pilots, to ensure awareness of the newly-published procedures.
Commercial airlines	Other costs	The risk of diversion increases when VFR approaches are flown. This would expose MRO customer aircraft to additional ATC/Nav charges and fuel and potentially to crew re-scheduling.	No other costs identified.

Airport / ANSP	Infrastructure costs	If ILS procedures are withdrawn permanently, the ILS equipment would be decommissioned, with the associated costs.	No additional infrastructure costs.
Airport / ANSP	Operational costs	There is anecdotal evidence that ATCO workload at NATS Cardiff may increase marginally, but is unlikely to result in additional ATCO costs.	No additional operational costs.
Airport / ANSP	Deployment costs	No deployment costs	Costs associated with producing CAP 1616 deliverables.
Safety Assessment	Safety Assessment	Commercial airline pilots arriving at St Athan to make use of MRO facilities would routinely fly instrument approaches (ie ILS) and are unlikely to be well-practiced in VFR operations. These aircraft's tracks through the Cardiff CTA and CTR may be less predictable and they may require additional radar vectors from ATC.	Procedures in the Mil AIP were approved by CAA and assumed safe, there is no change to the safety argument.