



Manston Airport Safeguarding Assessment

Review of Wind Business Support Report

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1 Introduction

1.1 Overview

RiverOak Investment Corp (RiverOak) is committed to the reopening of Manston Airport (formerly Kent International Airport) and is in early discussions with the Planning Inspectorate concerning the submission of an application for a Development Consent Order (DCO) for what would be a Nationally Significant Infrastructure Project (NSIP). This report should be read in conjunction with the earlier Osprey Consulting Services Ltd (Osprey) Aviation Impact Assessment (AIA) – *Effect of Proposed Communication Masts on Operations conducted at a reopened Manston Airport 70990 001 Version 2*, dated April 2016 [Reference 1].

RiverOak commissioned the AIA [Reference 1] which sought to determine if two proposed communication masts (the Vigilant Global UK Ltd (Vigilant Global) Communications Mast and the separate proposal for construction of the New Line Networks (NLN) Mast at Kings End Farm) would influence safe operations at Manston Airport were it be reopened and licensed in accordance with Civil Aviation Authority (CAA) and European Aviation Safety Agency (EASA) Regulations.

The Vigilant Global mast proposal is for a single steel lattice mast 322 metres (m) in height (324 m Above Ordnance Datum (AOD)) together with nine anchor points, installation of telecommunications and associated equipment, site compound, secure fencing, single storey equipment structure, and associated works at the former Richborough Power Station, Ramsgate Road, Sandwich, CT13 9NL. The Dover District Council (DDC) planning application reference number is 16/00044.

This document was authored and internally reviewed by personnel with substantial operational aviation knowledge. It reviews the assessment conducted by Wind Business Support (WBS), which has been submitted in support of the planning application, on behalf of Vigilant Global [Reference 2], of the potential impacts of the proposed single steel lattice mast on Manston Airport should the aerodrome return to operational use.

Osprey's assessment of the Vigilant Global mast project has been impartial, offering our professional opinion and expertise on the perceived impact of the development on Manston Airport; the WBS Report has not changed our opinions contained in Reference 1 of the operational impact the mast will create to a reactivated Manston Airport. However, for completeness, we will explain where our views differ from those of WBS and why. We will also introduce assessment and opinion by suitable third party subject matter experts that support our view. Details of the author, reviewer and approver of this document can be found at Annex A1.

1.2 Findings of the Osprey AIA [Reference 1]

1.2.1 Obstacle Limitation Surfaces

As part of this assessment, the previously protected Obstacle Limitation Surfaces (OLS) for the airport were established and assessed in relation to the Vigilant Global

mast. It was found that the proposed Vigilant Global mast would penetrate the Manston Airport Inner Horizontal Surface (IHS) by 224 m, a significant breach. Osprey assessed that if Manston Airport were operational, safety concerns associated with such a severe breach so close to the airport, would cause the airport operator to object to the development on the grounds of CAA Airport Safeguarding Regulations.

1.2.2 Aircraft Arrival and Departure Procedures/Radar Vectoring Area

The AIA also identified that construction of the Vigilant Global mast would require the minimum vectoring altitude of the Radar Vectoring Area (RVA) in the region of the mast to be increased from 1,500 to 2,100 feet (ft). This may influence the design of any new Instrument Flight Procedures (IFPs) for the airport and may affect any decision on suitable aircraft holding heights. The Vigilant Global mast would also need to be taken into account by radar controllers at Manston when vectoring aircraft near the airport to ensure prescribed separation is maintained between the mast and an aircraft. Osprey assessed that, though not in itself grounds for objection to the proposal, there would be an impact of the Vigilant Global mast development on Manston Airport Instrument Flight Rules¹ (IFR) operations, which would need to be mitigated and managed.

1.2.3 Visual Circuit Operations

The AIA also found that aircraft operating in the Manston visual circuit to the south of the airport would be confronted by the Vigilant Global mast as they turn downwind within the circuit; aircraft are legally obliged to avoid such obstructions by at least 500 feet (ft) either laterally or vertically. The construction of the Vigilant Global mast would create an obstacle, which can be difficult to acquire visually from the air especially in marginal weather conditions. A cumulative effect would be created with the construction of the NLN mast, an effect that would be difficult to mitigate.

To address the hazard created by the construction of the mast, the AIA considered whether the circuit height could be increased or the track of the visual circuit extended to the south; however, both these measures introduce new safety hazards to Visual Flight Rules² (VFR) operations at Manston Airport. The use of a northerly circuit would reduce the impact created by the Vigilant Global mast; however, this would concentrate VFR traffic to the north producing a potential choke point over a populated area, moving the noise footprint and other environmental effects over an area used for tourism and recreation. Finally, the AIA found that the presence of such large obstructions so close to the airport would constitute an enduring hazard to VFR operations to the south. Raising the visual circuit height would reduce poor weather options to the VFR pilot near the airport.

If Manston Airport were operational, the residual safety impact on VFR operations, despite implementation of mitigation measures, would result in what is considered a sustainable objection by the airport operator.

1.2.4 Aerodrome Traffic Zone (ATZ)

¹ IFR: Regulations and rules established to govern flight when due to weather or other conditions flying the aircraft by using outside visual references is not safe. IFR flight depends on flying the aircraft by reference to instruments on the flight deck and external electronic signals.

² VFR: A set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

The purpose of an ATZ at Manston would be to provide protection to aircraft departing, arriving or flying near the airport by ensuring that any aircraft in the immediate vicinity of the airport is required to contact ATC.

In theory, the proposed masts would have little impact on Manston Airport's application for an ATZ. However, in practice the Vigilant Global masts operational impact on IFR procedures and significant operational and safety impact on VFR procedures, completely undermines the case for establishment of an ATZ.

1.2.5 Radar Operations

Radar operations were previously conducted from Manston utilising an onsite ATC radar system. After the airport's closure, the radar system was decommissioned and removed. It is envisaged that, should Manston reopen, a replacement radar system will be installed to provide radar surveillance to enhance flight safety in the unregulated airspace surrounding the airport. Radar systems have the potential to create interference to digital radio-relay systems in some situations and vice-versa.

Manston Airport will have a responsibility to ensure a safe operating environment is maintained; this includes the electro-magnetic spectrum. The nature of emissions from the Vigilant Global mast and its alignment are not yet known; the potential technical impact cannot therefore currently be assessed. Any potential effects of radar interference created by the Vigilant Global mast if it is constructed would have to be considered during the procurement of any new radar system and may influence the nature and cost of the solution.

1.3 Osprey Company Background and Expertise

Osprey is an independent privately owned aviation focused consultancy. The company was founded to offer a genuinely independent approach to engineering, operations and management support to the aviation market.

We have supported over 40 individual Air Traffic Management (ATM) programmes in the past 8 years ranging from complete replacement of airport ATM equipment through to complex Airspace Change Programmes. Our staffs are all aviation specialists having worked within the aviation industry for many years (as Air Traffic Controllers, Engineers and Aircrew). They are professional and dedicated to delivering a very high quality service to our clients.

We believe our success is down to our unique ability to offer a team with current flying, controlling and engineering expertise. These skills are applicable to military and civil scenarios, air traffic control and management alike and have been brought to bear in this report.

1.4 Document Structure

The following structure is followed through the document:

- Section 1 (this section) introduces the report;
- Section 2 reviews the analysis contained within the WBS Report: *Richborough Communications Mast: Manston Airport Impact Assessment*;
- Section 3 provides the conclusions to this report; and
- Section 4 provides a list of references used throughout the document.

2 Review of the Analysis Contained in the WBS Report

The following section provides a review of each Section of the WBS Report, completed on behalf of the applicant, Vigilant Global UK Limited.

2.1 Review of Section 1 of the WBS Report (Introduction)

2.1.1 Assessment Criteria

Within the Management Summary of the WBS Report it states that:

'the aerodrome is located approximately 3.5 kilometre (km) north of the proposed mast'.

However, within Section 1 this distance is later referred to as:

'the aerodrome is located approximately 4 kilometres (km) north of the proposed communications mast'.

No point of reference measurement at Manston Airport is stipulated (e.g. Aerodrome Reference Point, Runway Mid-point, Runway Threshold). When assessing obstructions such discrepancies (in distance and reference point) are significant and call into question the accuracy of subsequent assessments and conclusions.

WBS correctly state that Manston Airport is currently closed and

'there is therefore no active aerodrome operator that can be contacted directly to discuss proposals with regards to any future use of Manston Airport'.

However, Osprey has assessed the proposed development against the appropriate CAA and planning regulations. Equally, a number of objections to the mast have been lodged with the Dover District Council including a private pilot, a regular user of the airport when it was active and a Director of the Aircraft Owners and Pilots Association (AOPA).

Osprey contend that, by applying extant regulations and taking into account the views of suitable experts, expressed in the consultation process, it is therefore possible to consider the potential impact of the proposed Vigilant Global mast were the airport to be operational. The Osprey AIA concluded that safety concerns associated with such a development so close to the airport would result in a sustainable objection by an incumbent airport operator.

2.1.2 Aerodrome Licensing

CAA CAP 168 *Licensing of Aerodromes* [Reference 3] is published in support of the discretionary powers relating to the granting of an aerodrome licence contained in CAP 393 *Air Navigation: The Order and the Regulations (ANO)* [Reference 4]. CAP 168 states that:

'Prior to the grant of a licence and for continuing licensing, the CAA inspectors will visit the aerodrome and determine the extent to which the aerodrome, its facilities and its operational procedures meet the licensing requirements. In making its assessment of an application for or continuation of a licence the CAA will adopt as flexible an approach as is consistent with the achievement and maintenance of a satisfactory level of safety.'

The proposal to develop the Vigilant Global mast to the south of Manston Airport would significantly infringe the CAA OLS criteria, which are specifically established to ensure safe operations in the vicinity of an airport. The severity of this infringement, which cannot be fully mitigated, could undermine Manston Airport's case for a CAA Licence and EASA approval. This, in turn, would have significant commercial implications as operators may not wish (or be able) to operate from an unlicensed or non-EASA compliant airport.

WBS consider that the

'future re-opening of Manston Airport is speculative'.

However, RiverOak is fully committed and has demonstrated its desire to revive Manston Airport as a successful hub for international airfreight that also offers passenger flights, executive travel and aircraft engineering services. RiverOak has demonstrated this commitment across two years of campaigning to purchase and reopen the airport and their commitment has never wavered. RiverOak believes that Manston's accessibility, long runway and community support represent the strongest option available to Government to increase runway capacity in the South East for airfreight. The airport will serve airfreight operators, ease surface congestion, improve resilience and boost economic growth in Kent. Support to aviation use at Manston Airport continues to be a key planning policy objective of Thanet County Council's Local Plan. In light of this evidence, it is difficult to support the assessment that the future reopening of Manston is *'speculative'*. To that end Osprey consider that its potential reopening and the impact on the Airport's ability to gain an EASA licence must be considered as part of any evaluation of the Vigilant Global mast proposals; this evaluation has been omitted from the WBS Report.

2.1.3 Consultation feedback

WBS state that:

'As part of the planning process for the proposed mast, aviation stakeholders have been consulted directly. NATS En-route plc, the UK air navigation provider, and the Civil Aviation Authority (CAA), have raised no objections to the scheme following the submission of the planning application, and stated that the proposed lighting arrangement is deemed acceptable'.

NATS En-route are responsible for the management of the nationwide en-route air traffic network; invariably this is above 10,000 ft or within controlled airspace in the vicinity of major airports. Their response therefore reflects that there is no network impact associated with the proposals; it does not consider any impact at airport level unless NATS have responsibility for that airport. Indeed, its reply to consultation highlighted that in its response:

'...does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise'.

While RiverOak have had informal discussions with the CAA and are developing proposals for the regaining of the aerodrome licence and introduction of flight procedures, no formal submissions have yet been made to the CAA. Therefore, the CAA response is predicated on the information it held at the time. Neither the NATS nor CAA response should be interpreted to imply that there would be no impact on Manston Airport should it re-open.

2.2 Review of Section 2 of the WBS Report (Impacts on Use as a Licensed Aerodrome)

2.2.1 An existing mast

WBS provides information of the past and present obstacle baseline environment within Section 2 of their report. They correctly identify a much smaller, existing mast, located to the north of the site planned for the Vigilant Global mast. However, crucially, unlike the Vigilant Global mast proposal, this mast does not penetrate the Manston OLS (specifically the IHS).

CAP 168 states that:

“New objects, or additions to existing objects, should not extend above an inner horizontal surface, a conical surface or an outer horizontal surface, except, when in the opinion of the CAA, the object would be shielded by an existing immovable object, or it is determined that the object would not adversely affect the safety or significantly affect the regularity of aircraft operations.”

The concept of shielding only applies where there is a substantial and permanent object, or natural terrain feature, that already penetrates the OLS. The CAA may accept (at their discretion) objects of lesser or equal height around this shielding object penetrating the surface; however, due to the severity of the penetration by the Vigilant Global mast there is no apparent shielding, near Manston, to minimise any effect to the Airport’s OLS. The smaller existing mast referred to in the WBS Report therefore has no relevance.

2.2.2 A previous obstruction

WBS highlight that when Manston was last operational there was a single chimney located at the Richborough Power Station, which penetrated the Manston IHS by 33 m. In controlled blasts, the three cooling towers and the single chimney of the Richborough Power Station were demolished in March 2012. However, if approved, the Vigilant Global mast would significantly penetrate the Manston IHS by 224 m (much greater than was created by the now demolished Richborough Power Station chimney).

With regard to the restriction and the removal of obstacles, CAP 168 provides the following guidance:

“Existing objects above an approach surface, transitional surface, take-off climb surface, inner horizontal surface or conical surface should as far as practicable be removed, except when in the opinion of the CAA the object is shielded by an existing immovable object”

Osprey does not have historical evidence as to how construction of the Richborough Power Station cooling towers were approved but it is likely that this was under

different safeguarding criteria and when Manston was a Royal Air Force (RAF) Station; it is equally unclear what the RAFs approach to safeguarding would have been at the time.

The CAA regulations are clear; where a pre-existing obstruction exists it should, as far as practicable, be removed. With regard to the previous cooling tower obstruction, this has now been done. The presence of a previous, much smaller obstruction, when the airfield was MOD operated cannot be considered a relevant precedent. Indeed, to do so runs directly contrary to CAA regulation.

2.2.3 Instrument Flight Procedures

The CAA is the regulator with respect to Instrument Flight Procedures (IFPs), setting the associated policy and issuing approvals to individuals and organisations for designing IFPs. The CAA audits procedure designers and design organisations to ensure that they maintain the highest standards to promote safe and flyable procedures. The CAA has approved six design organisations or individual designers.

The author of the WBS Report assesses the potential impact the Vigilant Global mast would have on the previously published Manston IFPs. However, the WBS Report does not state if the Author holds the necessary CAA accreditation to make such an assessment. The earlier Osprey report, *Manston Airport Safeguarding Assessment* [Reference 1] included a review by a CAA approved and accredited procedure designer. The review considered the previously published flight procedures for the airport and the influence the construction of the Vigilant Global mast may have on them. Given the desire to reopen for commercial flight and freight operations, a consideration of future likely procedures was also taken. The reviewer is a current commercial pilot, CAA Approved Procedure Designer (CAA APD), and flying examiner and instructor. His conclusions stated that the proposed mast would affect the operations of Manston Airport if it were to reopen for commercial aircraft. Although some impacts may be militated against, the mast would influence instrument departure procedures, aircraft holding patterns and visual manoeuvring of aircraft following an instrument approach. Furthermore, it is likely that there would be greater overflight and environmental impact to the main built up areas of Margate, Broadstairs, Ramsgate, and Herne Bay.

2.2.4 Visual Manoeuvring (Circling) Area

WBS state that:

‘The VM(C) area is one in which obstacle clearance should be taken into consideration for aircraft carrying out a circling approach’.

It also states that:

“It is likely that the proposed mast is too high to allow circling at a sufficiently low altitude in the area of the mast for some aircraft”

Osprey agrees with the above statements. However, their implications are that, with the exception of small light aircraft, all the visual manoeuvring procedures would need to be restricted to flying on the north side of the airport. This would have an environmental impact on the more densely populated areas on the Kent north coast.

Any new design of procedures for a reactivated airport is likely to include the use of a Visual Manoeuvring (Circling) Area. For environmental reasons and noise

abatement, it can be seen that the area most likely to be used to conduct a circling manoeuvre will be to the south of the airport to avoid the populated areas of Broadstairs, Margate and Ramsgate, north of the extended runway centrelines at the aerodrome. Any increase in the Obstacle Circling Height (OCH) for the procedure is likely to restrict its use in marginal weather conditions, as aircraft may not be able to maintain Visual Meteorological Conditions³ (VMC).

WBS also state that:

“There are no obstruction reasons why aircraft using an instrument approach to either end of the Manston runway (denoted runway 28 or runway 10) would need to conduct visual manoeuvring (circling)”.

The UK Integrated Aeronautical Information Publication (UK IAIP) [Reference 5] describes the procedure as one that is completed after an aircraft has completed an instrument approach⁴. Subject to prevailing weather conditions which allow the flight to continue in VMC, the pilot may position the aircraft visually to circle to land on another runway (at dual runway aerodromes) or the opposite end to the runway (at single runway aerodromes); the manoeuvre is not restricted to aerodromes with more than one runway surface (as indicated in the WBS Report).

Osprey accept that the incidence of a circling approach being performed is likely to be low; however, when stating that there are no obstruction reasons for an aircraft flying a circling approach the WBS assessment has failed to take into account the following:

- Pilot training/continuation training - aircrew practice the manoeuvre even when weather conditions or operations do not demand it. Previous operations at Manston included the operation of light aircraft and a flight training company that had been based at the aerodrome for 30 years before its closure and an enforced move to Lydd Airport. British Airways had selected Manston Airport as a base to conduct flying training on its Airbus A380 and Boeing B787 aircraft from July 2013, the first of the flights took place with the A380. Demonstrating the ability to fly such procedures is an essential element of pilot training and examination.

Commercial cargo operators will require a degree of certainty in operating from Manston airport; some cargos can be time critical. It could therefore be anticipated that, in the event of the Instrument Landing System (ILS) on the in-use runway being unavailable (due to maintenance or unserviceability), aircraft may more frequently use the ILS on the out-of-use runway until the required visual references are achieved to circle and land on the in-use runway.

Although it is accepted that these are potential requirements, they are relevant and realistic. It is therefore difficult to support the WBS assessment that there is no requirement for a circling approach.

³ VMC. Flight in which visual flight rules (VFR) flight is permitted, conditions in which pilots have sufficient visibility to fly the aircraft maintaining visual separation from terrain, obstructions and other aircraft.

⁴ An instrument approach to a runway can be completed in any weather conditions (although in good weather the approach may be completed for training purposes).

2.3 Review of Section 3 of the WBS Report (Impacts on Use by Light Aircraft (General Aviation))

2.3.1 VFR Regulations

The Standardised European Rules of the Air (SERA) took effect across Europe in December 2014 [Reference 6]. The rule (known as the '500 ft Rule') is included within the Official Journal of the European Union Regulation (EU) No 923/2012 and states that:

... "except when necessary for take-off and landing, or except by permission of the competent authority, a VFR flight shall not be flown at a height less than 500 ft above the ground or water, or 500 ft above the highest obstacle within a radius of 500 ft from the aircraft".

2.3.2 Impact of the mast on visual circuit operations

The Osprey AIA identified aircraft turning downwind in the visual circuit would turn directly towards the mast at the same altitude, leading to a requirement to avoid the mast by a minimum of 500 ft. Section 3 of the WBS Report provides background information on the use of visual circuits by General Aviation (GA) aircraft and provides details of the previously published visual circuits in use at Manston Airport; track, direction of turn and altitudes/heights at which aircraft were to fly. All jet and aircraft exceeding 5,700 kg Maximum Total Weight Authorised (MTWA) would fly a circuit height of 1,700 ft (QNH⁵)/1,500 ft ((QFE⁶). All other aircraft that are not subject to noise abatement procedures (such as GA aircraft) flew the circuit at 1,200 ft QNH/1,000 ft QFE.

The WBS Report accepts that:

"The circuit height in the above is 1000 ft above ground level (1000 ft QFE), which is typical for light aircraft. This is below the level of the top of the mast. For this reason, with the proposed mast present, future circuits would have to avoid the immediate area of the proposed mast. It would be impractical to have a circuit at an elevation sufficiently above the proposed mast. This does not prevent circuits to the south".

"The previously published circuits for Manston provide circuits both to the north and the south of the airport at 3 nautical miles (nm) (5.6 km) from the runway to the north and an unspecified distance to the south".

Traditionally aircraft circuits at Manston were flown to the south of the aerodrome over uninhabited marshland and land used for industrial means to the south of Minster and Monkton. Pilots would fly the circuit to remain visual with the airfield; the small number of complaints from residents provides evidence that any nuisance to local residents was negligible.

2.3.3 Changing circuit height

⁵ QNH Barometric Pressure adjusted to sea level, aircraft altimeter will read the altitude of an aircraft above mean sea level.

⁶ QFE Local Barometric Pressure, which refers to the altimeter setting that, will cause the altimeter to read the height above a specific aerodrome or ground level, and therefore read zero on landing.

For aircraft flying a southerly visual circuit, the WBS Report acknowledges the detrimental impact to flight safety that would be created by the Vigilant Global mast. Furthermore, WBS accept that any increase in circuit height would not provide suitable mitigation as

“an increase in circuit height would also require an increase in cloud base height to allow visual flight”.

There are other reasons why changing circuit height is undesirable which are covered in the Osprey AIA.

2.3.4 Changing circuit position

The use of the northerly circuit would reduce the impact created by the masts; however, the exclusive use of the northerly circuit will concentrate the noise footprint and other environmental effects creating a potential VFR choke point to the north of the Airport over a populated area used for tourism and recreation. Equally, the residual risk to the south of the airport would remain.

2.3.5 Changing circuit route to the south of the mast

WBS provides examples of alternate circuits, which it states:

“provide horizontal separation from the proposed mast”.

WBS also informs the reader of the responsibilities of aircrews visually to avoid the mast and accepts that the mast will:

“need to be avoided but this can be readily and safely be achieved”.

However Osprey assess that changes to the lateral extent of the visual circuit to address the safety issues associated with the mast would introduce other safety issues as a result. These include:

- Aircraft that encounter a problem whilst flying downwind in the circuit (GA aircraft are invariably single engine), will not be able to turn into the airfield until they are certain of remaining clear of the mast.
- Compromise in the maintenance of visual contact with the airfield as pilots concentrate on avoiding the mast.
- Longer periods of flight over the sea for single engine aircraft when they are low and slow; thereby significantly increasing the risk of ditching in the event of an engine failure at this critical stage of flight.
- Maintenance of visual separation from the mast would cause further hazards in the event of an aircraft emergency or poor visibility situations. The avoidance of the mast, together with the added distraction of handling an aircraft emergency, could potentially lead to pilot error and a subsequent unsafe situation.

Moving the circuit further away from the airfield would also increase environmental effects such as increased fuel burn, and expansion of the noise footprint to a wider area, away from the immediate area of the aerodrome.

2.3.6 Changing the southern circuit route to the north of the mast

To route north of the mast (but south of the airfield) would see aircraft complete a continuous and steep turn onto final approach for landing thus increasing the risk of

unstable approaches (where a pilot misjudges height, speed or alignment with the runway). This is a non-standard approach, which would be unfamiliar to visiting pilots, and introduces significant risk to both aircraft and third parties on the ground.

2.3.7 The residual risk

In all circumstances flying a southerly circuit, including the “*alternate circuits*” suggested in the WBS Report; the construction of the Vigilant Global mast would create an obstacle which can be difficult to visually acquire from the air especially in marginal weather conditions, for any skill level of pilot, and particularly whilst the aircraft is configured for the impending approach to the runway. Add additional factors such as a visiting pilot, the distraction of integrating into a busy circuit pattern or an aircraft emergency, and it is difficult to comprehend the WBS assessment that it is acceptable to expect pilots to maintain 500 ft visual separation from an obstruction at the same height.

2.3.8 Third party expert opinion

Ospreys assessment is based on its thorough understanding of the regulations along with experience as Air Traffic Controllers and both commercial and private pilots. However, to reinforce the practical implications of the Vigilant Global mast proposals we felt it would be helpful to obtain the views of a third party GA pilot who has vast experience of operating from Manston.

Osprey therefore obtained the following independent analysis from a private pilot licence holder who holds display pilot authorisation who has extensive experience of operating from Manston. Their expert opinion is included in full below:

Plans to erect a Mast(s) in the vicinity of the visual Circuit at Manston Airport

I learnt to fly at Manston in 1986 and continued to operate from there until its closure in 2014. In my opinion, the erection of trading masts within the vicinity of the visual circuit would present an unacceptable risk to aircraft landing, departing and training at Manston.

- 1. When joining or operating in a visual circuit it is important to identify the position of other aircraft doing the same. Having to identify and avoid a structure of the size planned is likely to distract a pilot from their lookout for other aircraft.*
- 2. Whilst a standard orbit is in the circuit direction, in reality aircraft are instructed by ATC to orbit out of the circuit in order to maintain separation for IFR traffic. This would require aircraft leaving the circuit in order to maintain the 500 ft rule.*
- 3. In certain conditions, it is very difficult to identify masts. The position of the sun, the weather conditions, seasonal changes in the surrounding countryside and the change from sea/land can make identification very difficult (see attached photos).*
- 4. Moving the circuit outside the mast(s) means that the circuit will not be a standard circuit, this raises a number of issues for visiting traffic. It also means that the base leg for Runway 10 and crosswind leg for 28 takes aircraft out over the sea for a longer period. This is an unacceptable risk, especially for rare vintage aircraft.*
- 5. Manston has always been a diversion airfield for aircraft in trouble crossing the Channel. (There were at least two civilian and one military diversion during the*

consultation period for the orderly closure of the airfield). In poor weather the airfield is easy to locate by following the coastline, however, a mast close to the visual circuit in conditions of poor visibility would be a hazard to such aircraft.

Should an aircraft fly into the mast not only are lives likely to be lost, but the trading the masts are to be erected to support would also suffer. The risk is not acceptable.

The photograph mentioned within point 3 above is provided below and amplifies the challenge to pilot's in acquiring visually, obstructions of the nature of the Vigilant Global mast.



Figure 1 Dover Transmitter Mast (for illustrative purposes), the aircraft is flying 700 ft above the mast

The Vigilant Global mast would be 25% bigger than the mast in the figure. Within the illustration, no guy-lines can be seen, nor any aviation lighting despite the photographs being taken in good weather conditions. Few aircraft will have the luxury of looking out for the Vigilant Global mast above the horizon and for most the rural background (as shown in Figure1) and the potential shimmer from the sea will make it extremely difficult to acquire. For aircraft descending into the visual circuit

area, visual acquisition of the mast will be particularly difficult against an agricultural background.

2.4 Review of Appendix B of the WBS Report (Examples of Aerodromes with Managed Obstacles)

2.4.1 Licensed Aerodromes

The safeguarding of the obstacle environment around an airport ensures the safety of aircraft, and therefore by default the local communities surrounding the airport. For large commercial aircraft, the implications to both aircraft and third parties on the ground need to be fully considered. As part of the Osprey AIA completed on the Vigilant Global mast [Reference 1], the OLS for Manston Airport were established and assessed in relation to the proposed Vigilant Global mast. CAP 168 [Reference 3] sets out the standards required at UK licensed aerodromes relating to management systems, operational procedures and physical characteristics for the assessment and treatment of obstacles, further information is included within sub-paragraph 2.1 of this review document.

2.4.2 Unlicensed Aerodromes

It is a legal requirement for an aerodrome to be licensed if it is used for:

- commercial passenger flights;
- public transport passenger flights;
- flying training in aircraft above a specified weight.

Due to the commercial and international nature of its operation, Manston would be a licensed aerodrome that is compliant with European (EASA) regulations; this, in turn, places considerable responsibility on the airport to manage and assure a safe operating environment.

There are examples of TV masts close to unlicensed small airfields in the UK, for instance, at Membury airfield, which is included within the WBS Report. These unlicensed airfields do not need to meet the safety standards of a licensed aerodrome and are generally used for recreational flying in light aircraft, microlight aircraft, and gliders.

Flying at these types of unlicensed aerodromes assumes that the pilot accepts a higher level of risk, and that the risk is mainly on the pilot, because the risk to third parties on the ground is very small for these types of small aircraft. However, for larger commercial aircraft, the risk to third parties on the ground is different and the duty to protect paying passengers is at a far higher standard. For these reasons, the safeguarding of obstacles near an airport, such as Manston, must be performed to a higher standard. Counter arguments based on examples of small unlicensed aerodromes, such as those included in the WBS Report, are therefore not relevant and have been excluded from this analysis.

2.4.3 WBS examples of aerodrome obstructions

Appendix B of the WBS Report provides examples of obstructions close to licensed and unlicensed aerodromes. As stated above, comparison to unlicensed aerodromes is irrelevant, as they are not obliged to apply safeguarding criteria; they have therefore been excluded from this review. However, for the four licensed

aerodromes there was no analysis in the WBS Report to establish whether the example obstructions quoted would penetrate the OLS for the specified aerodrome, nor does it analyse the operations and the potential influence to established flight paths of aircraft at the aerodromes. Osprey has completed the analysis omitted from the WBS Report. Table 1 below provides the results of this analysis.

| Licensed Aerodrome | Obstruction | Location in relation to the OLS | Breach of OLS | Extent of Breach (ft) | Range from OLS Datum (Airfield Reference Point (ARP) or Runway Threshold) |
|--------------------|--------------------|---------------------------------|---------------|-----------------------|---|
| Prestwick | Mast | Conical Surface | No | Nil | 4.88 km (Runway Threshold) |
| Bristol | Mast | Conical Surface | Yes | 36 ft | 4.62 km (Runway Threshold) |
| Old Buckenham | Mast | Beyond the OLS range | N/A | N/A | 6.3 km (ARP) |
| Cardiff Airport | Mast | Outer Horizontal | Yes | 582 | 8.18 km (ARP) |
| | Chimney 1 (350 ft) | Inner Horizontal | No | Nil | 2.72 km (Runway Threshold) |
| | Chimney 2 (510 ft) | Inner Horizontal | Yes | 158 | 3.72 km Runway Threshold) |

Table 1 Analysis of Obstructions included in the WBS Report

Prestwick Airport

The listing for Prestwick Airport within Table 1 above lies underneath and below the airport's OLS. The mast stands on elevated land and rises to approximately 201 ft above ground level. The UK IAIP states that all airline crew-training circuits shall be flown at a height of at least 1,500 above aerodrome level (aal). In other respects and for noise abatement purposes aircraft should climb to height 1,500 ft before turning into the circuit. The height flown for training circuits provides sufficient vertical clearance from the mast for safe flight operations.

Bristol Airport

The Bristol mast breaches the conical surface established for the airport by 36 ft. When compared to the breach of the Vigilant Global mast of over 737 ft, the breach at Bristol is relatively insignificant. Visual circuits are normally flown to the south of Bristol Airport, which immediately takes the aircraft's track away from the mast location. It is unknown if the mast impacts any other operation conducted at the airport to the extent of potential the Vigilant Global mast will have to operations

conducted at a reopened Manston Airport. However, in summary, the breach is far less than seen at Manston, is further away from the airfield and does not affect the visual circuit.

Old Buckenham Aerodrome

Old Buckenham Aerodromes OLS is not infringed. It is not therefore a relevant comparator.

Cardiff Airport

Though the mast quoted represents a significant vertical breach, at over 8 km from the airport the effect on Cardiff airport would be far less. As with Manston, it is likely that impact on IFR procedures could be managed, as the mast is clear of the runway centreline. Due to its distance from the airport, it would not represent a hazard to visual circuit traffic. However, it is worthy to note that Cardiff VFR Guide to visiting pilots states:

“After junction 36 route direct to just north of St Hilary television mast. If it is hazy you might not see the mast until you are close so be aware that it is 1161 feet QNH”.

Confirming the Osprey assertion that such structures are difficult to acquire visually.

Chimney 2 (Table 1) is within the lateral confines of the St Athan Local Flying Zone (LFZ). During the hours of operation of the LFZ (maximum altitude 1,700 ft amsl), aircraft are to be in communication and comply with instructions from St Athan ATC. Outside of the hours of operation of St Athan ATC, gliding may take place within the area subject to approval from Cardiff ATC. When the LFZ is activated aircraft operations from Cardiff Runway 12/30 (the closest runway to the chimney) are restricted (visual approaches from the south to Runway 12 are unlikely to be authorised and departures from Runway 30 are required to climb straight ahead to avoid the area). This indicates that the area of airspace is of less significance to operations conducted at Cardiff Airport and an area where obstructions may not have a significant impact to normal operations. Furthermore, visual circuits conducted at Cardiff are normally flown to the north of the aerodrome (away from the chimneys location).

2.4.4 Mitigation of obstacles

CAP 168 defines an airports OLS and their characteristics and describes the action to be taken in respect of objects which infringe them. In ideal circumstances, all the surfaces will be free from obstacles but when a surface is infringed, any safety measures required by the CAA will have regard to:

- The nature of the obstacle and its location relative to the surface origin, to the extended centreline of the runway or normal approach and departure paths and to existing obstructions;
- The amount to which the surface is infringed;
- The gradient presented by the obstacle to the surface origin;
- The type of air traffic at the aerodrome; and
- The instrument approach procedures published for the aerodrome.

Safety measures could be as follows:

- Promulgation in the UK IAIP of appropriate information;

- Marking and/or lighting of the obstacle;
- Variation of the runway distances declared as available;
- Limitation of the use of the runway to visual approaches only; and
- Restrictions on the type of traffic.

Note: not all of the above may be appropriate for a given aerodrome. The degree of freedom from obstacles must be determined by survey in accordance with CAP 232 *Aerodrome Survey Information* [Reference 7].

The effects of obstacles on aviation interests have been widely publicised; the primary concern is one of safety with operational effectiveness and efficiency as additional considerations. Such obstructions can have a physical and/or technical impact on an airport. For example, buildings and the erection of new structures can present a physical obstruction at or close to an aerodrome which despite their size, can be difficult to see from the air in certain weather conditions. Equally, airport runways, procedures and Communication, Navigation and Surveillance (CNS) systems also require protection.

WBS state:

“the successful management of obstacles including masts is illustrated by a number of existing examples of both licensed and unlicensed aerodromes”.

The successful management of obstacles is dependent on the scale of any impact and any measures that can be successfully employed to mitigate the obstacle. Successful mitigation is dependent on the size of the airport, the nature of the control service it provides, the type of procedures used at the airport, the range of the obstruction from aerodrome/aircraft flight procedures and the type of aircraft that utilise the flight procedures.

As the aerodromes listed above within Table 1 successfully manage the obstacles included in the WBS Report, it is considered that the effect to operations at the individual aerodromes is negligible.

Our analysis of the obstacle examples given in the WBS Report suggests that their infringement of OLS is far less severe than would be for the Vigilant Global mast and their physical location is easier to manage, particularly as visual circuits turn away from the obstruction or are sufficiently distant. The Vigilant Global mast would be located 3.57 km from the Manston Airport ARP and would breach the IHS for Manston by a significant amount (over 737 ft) in what would be the airport’s operationally critical airspace.

2.5 Infrastructure and Airspace Issues not included within the WBS Report

As Manston no longer has an aerodrome licence, the development of operational processes and procedures required to ensure the safe and efficient operation of the airport is crucial. Not included within the WBS analysis is the potential impact the construction of the mast may create to the following airport airspace and infrastructure:

- An ATZ was previously established at Manston Airport. The purpose of an ATZ at Manston would be to provide protection to aircraft departing, arriving or flying near the airport by ensuring that any aircraft in the immediate vicinity of the airport are required to contact Air Traffic Control. In theory,

the proposed Vigilant Global mast would have little impact on Manston Airport's application for an ATZ. However, in practice the operational impact on IFR procedures and significant operational and safety impact on VFR procedures, completely undermines the case for establishment of an ATZ.

- Radar operations were previously conducted from Manston utilising an onsite ATC radar system. After the airport's closure, the radar system was decommissioned and removed. It is envisaged that, should Manston reopen, a replacement radar system will be installed to provide radar surveillance to enhance flight safety in the unregulated airspace surrounding the airport. Radar systems have the potential to create interference to digital radio-relay systems in some situations and vice-versa.
- Manston Airport will have a responsibility to ensure a safe operating environment is maintained; this includes the electro-magnetic spectrum. The nature of emissions from the Vigilant Global mast and its alignment are not yet known; the potential technical impact cannot therefore currently be assessed. Any potential effects of radar interference created by the Vigilant Global mast if it was constructed would have to be considered during the procurement of any new radar system and may influence the nature and cost of the solution. CAP 738 *Safeguarding of Aerodromes* [Reference 8] provides information and guidance on the safeguarding of aerodromes. The purpose of CAP 738 is to offer guidance to those responsible for the safe operation of an aerodrome or a technical site, to help them assess what impact a proposed development or construction might have on that operation. It provides the following information with regard to technical site safeguarding:

“Physical characteristics, such as the size, shape and construction materials, of a proposed development may affect the performance of aeronautical systems at or near an aerodrome. In addition, the siting of telecommunication or other radiating equipment can cause adverse electromagnetic interference to those systems. It may be appropriate (For the aviation stakeholder concerned) to approach other aviation organisations, especially where the Air Traffic Services (ATS) are provided by a third party organisation, on the aerodrome to ensure the proposal does not impact on their electronic systems. It is the responsibility of aerodromes with their ATS providers for the technical safeguarding of all of their radio sites for which they hold approvals under the Air Navigation Order [Reference 4]. Where necessary, procedures should be established to meet this requirement. Details of interference safeguarding criteria are outlined in CAP 670, Air Traffic Services Safety Requirements” [Reference 9].

3 Conclusions

3.1 Overview

The WBS Report does not change any of the conclusions made in the Osprey AIA.

This section summarises our review of the WBS Report and includes additional factors not fully explored by WBS.

3.2 Conclusions of the Review of the WBS Report

3.2.1 Impact on the Manston Airport OLS

The Vigilant Global mast would significantly infringe the CAA OLS criteria, which are specifically established to ensure safe operations near an airport. The severity of this infringement, which cannot be fully mitigated, could undermine Manston Airport's case for an EASA Licence. This, in turn, would have significant commercial implications as operators may not wish (or be able) to operate from an unlicensed or non-EASA compliant airport.

The WBS Report does not appear to fully explore the possibility of Manston Airport reopening nor fully analyse all the issues to conclusion. There are inconsistencies in how the mast locations are reported which call into question subsequent analysis. Equally, some of the examples given by way of precedent are irrelevant or not directly comparable. A current mast in the vicinity of Richborough does not penetrate the OLS and the use of the cooling towers (now demolished) as a precedent are contrary to CAA (CAP 168) guidance. Equally, the case studies quoted include unlicensed aerodromes (which are not subject to safeguarding regulation). For those licensed aerodromes quoted, the WBS Report does not explore the nature and degree of any obstacle impact; some obstacles do not penetrate the airports OLS and others, due to the nature or location of the obstruction, have little or no impact on airport operations. None of the given examples in the WBS Report compare either directly or indirectly to the severity of impact of the Vigilant Global mast on the Manston Airport OLS.

3.2.2 Impact on Manston Airport Operations

The conclusions of the review by a CAA approved procedure designer stated that, while the impact could be managed, the proposed mast would affect IFR operations at Manston Airport if it were to reopen. This would result in the altitude of the RVA in the region of the mast being raised from 1,500 to 2,100 ft; the circling procedure would also have to route to the north increasing the noise footprint to more populated areas.

However, the impact on VFR operations would be far great and appears to have been underestimated by WBS. As it is accepted by WBS that increasing the circuit height is unacceptable, the WBS Report therefore focused on the proposal for aircraft to route north or south of the mast (at the same height). Both proposals introduce new and significant flight safety hazards. Equally, the hazard of a pilot acquiring and maintaining visual contact with the mast, whilst integrating with other traffic, cannot

be underestimated. Add the factors of poor weather, aircraft emergency or visiting aircraft unfamiliar with Manston, and the risk would be intolerable, both to aircraft and, likely, to the CAA when considering Manston's application for an operating licence.

This is not solely the opinion of Osprey; to add further weight to this assessment we have canvassed the subject matter expertise of a highly experienced pilot that has operated from Manston for a prolonged period. The description of the difficulties confronted by a pilot, in visually acquiring a slender construction such as a communications mast, portrays a compelling and highly credible description of the flight safety risks the Vigilant Global mast would represent to VFR operations near the airport.

3.2.3 Consultation Response

The WBS Report states that neither NATS nor the CAA have raised an objection to the proposal. As our report has shown, this could give the reader a false impression. The NATS response relates to its responsibility for the UK ATC network or those airports for which it is responsible; none is affected by this proposal. The CAA response reflects the fact that, at present, only informal discussions have taken place with regard to the reopening of Manston; its response is therefore inevitably based on the current situation but RiverOak are already preparing proposals to regain the aerodrome Licence and establish the necessary flight procedures.

A number of objections to the mast have been lodged with the Dover District Council including a private pilot, a regular user of the airport when it was active and a Director of the Aircraft Owners and Pilots Association (AOPA); all reflect the Osprey opinion.

3.2.4 Infrastructure and Airspace Issues not included within the WBS Report

Not included within the WBS analysis is the potential impact the construction of the mast may create to the following airport airspace and infrastructure:

An ATZ was previously established at Manston Airport. The purpose of an ATZ at Manston would be to provide protection to aircraft departing, arriving or flying near the airport by ensuring that any aircraft in the immediate vicinity of the airport are required to contact Air Traffic Control. In theory, the proposed mast would have little impact on Manston Airport's application for an ATZ. However, in practice the Vigilant Global mast operational impact on IFR procedures and significant operational and safety impact on VFR procedures completely undermines the case for establishment of an ATZ.

Radar operations were previously conducted from Manston utilising an onsite ATC radar system. After the airport's closure, the radar system was decommissioned and removed. It is envisaged that, should Manston reopen, a replacement radar system will be installed to provide radar surveillance to enhance flight safety in the unregulated airspace surrounding the airport. Radar systems have the potential to create interference to digital radio-relay systems in some situations and vice-versa.

Manston Airport will have a responsibility to ensure a safe operating environment is maintained; this includes the electro-magnetic spectrum. The nature of emissions from the Vigilant Global mast and its alignment are not yet known; the potential technical impact cannot therefore currently be assessed. Any potential effects of

radar interference created by the communication masts if they are constructed would have to be considered during the procurement of any new radar system and may influence the nature and cost of the solution.

4 References

| Reference | Name | Origin |
|-----------|---|----------|
| 1 | Effect of Proposed Communication Masts on Operations conducted at a reopened Manston Airport 70990 001 Version 2 April 2016 | Osprey |
| 2 | Richborough Communications Mast Manston Airport Impact Assessment April 2016 | WBS |
| 3 | CAP 168 Licensing of Aerodromes Edition 10 February 2014 | CAA |
| 4 | CAP 393 Air Navigation Order: The Order and the Regulations Version 4.1 April 2015 | CAA |
| 5 | UK Integrated Aeronautical Information Package AIRAC 08/2016 | NATS AIS |
| 6 | www.caa.co.uk/sera Accessed July 2016 | CAA |
| 7 | CAP 232 Aerodrome Survey Information Edition 3 February 2008 | CAA |
| 8 | CAP 738 Safeguarding of Aerodromes Version 2 December 2006 | CAA |
| 9 | CAP 670 ATS Safety Requirements | CAA |

| Reference | Name | Origin |
|-----------|----------------------|--------|
| | Version3 May 2014 | |

Table 2 Table of References

A1 Osprey Brief Résumés

A1.1 Overview

Background information on the Osprey personnel who have compiled and completed peer review of the assessment is provided below.

Author

The Author is a Senior Consultant of Osprey CSL and has over four years' experience in performing impartial, independent assessments of the potential impact of both onshore and offshore wind farms for wind energy developers, airports and local planning authorities; currently examining, planning and validating airspace mitigation measures in support of the UKs renewable policy. Previously he completed 34 years of exemplary service and extensive expertise in all disciplines in Air Traffic Control and Airspace Management in the Royal Air Force in the role as Air Traffic Controller. The author is a highly capable aviation professional who possesses a wealth of operational and managerial experience and is a Subject Matter Expert on Aviation Safety Assessments and analysis of developments to affect air traffic management and airfield safeguarding criteria including OLS.

Reviewer

The Reviewer joined Osprey in July 2012 after a period of seven years at the CAA. During this time, he was lead point of contact for airspace planning and regulation of offshore operations, including navigation and communications infrastructure to support safe and efficient air traffic operations. Prior to the position at CAA the reviewer had 28 years RAF aircrew experience; 25 of those in fast jet operations worldwide.

Approver

The Approver has recently joined Osprey after 27 years as an air traffic controller in the Royal Air Force. In his most recent appointment, he was seconded to the CAA, initially as Assistant Direct of Airspace Policy 2 at the Directorate of Airspace Policy. On the formation of the Safety and Airspace Regulation Group, he became Deputy Head of the Intelligence Strategy and Policy Division where he was responsible for all CAA Safety Policy development and oversight of its major programmes including Spaceplanes, Unmanned Air Systems and State Safety. An excellent problem solver and negotiator, he was also heavily involved in managing the diverse requirements of civil and military stakeholders during the London 2012 Olympics and holds qualifications in strategic management, strategic direction, leadership and project management.