

WFAC

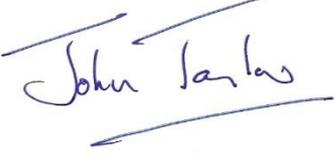
Wind Farm Aviation Consultants Ltd



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Indaver Ringaskiddy - Department of Defence Objection

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Scope

Wind Farm Aviation Consultants Ltd have been engaged by Indaver to consider the Department of Defence (DoD) objection to the proposed incinerator facility at Ringaskiddy, Cork¹ as part of a resource re-cycling development on the basis of a proposed impact on helicopter operations to the nearby naval base and to comment on that objection from a regulatory and operational perspective.

The DoD's objection is focussed on a perceived effect on operations when the wind is from a southerly direction; the Irish Air Corps (IAC) consider that the potential for effects from any plume (visible or invisible) may force them to impose a local no-fly restriction around the site with additional restrictions on operations to the naval base. The IAC consider that the operation of the incinerator could render certain helicopter approaches to the naval base unsafe.

Methodology

The IAC objection is offered together with what the IAC regard as supporting evidence in two main reference papers. In considering the validity of the DoD objection based on the contents of those papers WFAC are submitting a desk based assessment of those papers together with others deemed relevant and based on extant safeguarding Regulation, Policy and Guidance.

That assessment of the extant Regulation has used, as the primary source of reference, the Irish Aviation Authority (IAA) Integrated Aeronautical Information Package (IAA IAIP). That document can be regarded as the definitive source of extant and mandated Rules. The document incorporates the requirements of the Standardised European Rules of the Air (SERA) which came into force across Europe in December 2014 and superseded most (but not all) of the previous Rules of the Air Regulations. For the avoidance of any doubt WFAC will refer to extant Irish Aviation Authority Regulation and Guidance but, where any such policy or statement does not exist, International Regulation and/or best practise has been quoted and/or highlighted. In addressing the requirement as the Rules of the Air (RoAR) WFAC have applied both the terminology and requirement contained within the IAA IAIP² which reflects, not just SERA, but

¹ Department of Defence Submission dated 22nd April 2016.

² IAA IAIP ENR 1.General Rules and Procedures ENR 1.2.

also International Civil Aviation Organisation Standards, Recommended Practices and Procedures (SARPS).³

³ It is accepted that, within Ireland, military air bases, personnel and flight operations are regulated in accordance with regulations established by the Director of Military Aviation (GOC Air Corps), which are not required to comply with ICAO SARPS.

Introduction

There are two forms of definition of flight relating to the conduct of flights and the conditions and circumstances under which they may/must be adopted.

In simple terms:

- Visual Flight Rules (VFR) flight is when the pilot operates the aircraft in weather conditions which are clear enough to allow him to see where the aircraft is going and to see other aircraft, terrain and obstacles such that he can “see and avoid” anything representing a risk of collision or hazard to the aircraft. These weather conditions are known as Visual Meteorological Conditions (VMC).
- When flight under VFR is not possible due to weather or when the airspace classification demands it flights can be conducted under Instrument Flight Rules (IFR). The main purpose of flight in Instrument Meteorological Conditions (IMC) is to ensure safe separation of aircraft when the pilot cannot see or when traffic conditions are complex enough to demand ATC control.

The IAA have not raised any objection to the proposal; the proposal does not infringe any IAA safeguarding policy and/or that the IAA consider that there will be no effect on civil aviation resulting from the operation of the chimney. Similarly, Cork airport authorities have responded that they have no observations to make on the application.

IAA lighting requirements will be complied with.

Operations

The Helicopter Landing Site at Haulbowline is VFR only i.e. it has no instrument procedures and pilots can only approach in VFR conditions.

SI72/2004 Irish Aviation Authority (Rules of the Air) Order 2004 states that the minimum heights that can be flown include:

“.....closer than 150metres (500ft) to any person, vehicle, vessel or structure,.....at a height less than 150 metres (500ft) above the ground or water.”

These IAA Rules of the Air as the minimum that should be flown and that Minimum Height and Avoidance of Obstacles should be used to assess potential effects. Consequently, unless in very remote areas, pilots will fly at a minimum of 150m (500ft) above ground/water level (agl) since it

is impossible to guarantee the Requirement that an aircraft shall not be flown less than 150m (500) feet above the highest obstacle (which could be a fence, mast, structure) by simple visual observation alone unless in remote areas that have been previously cleared.

It is important to note the distance of 150m (500ft) is measured in any direction, not just the vertical and pilots are required by law to plan their flights in such a way that they do not fly closer than 500 feet to any obstacle **except** when landing or taking-off in accordance with normal aviation practise; this exemption applies to aircraft in the visual circuit (although good airmanship would dictate that any vertical obstacle is not directly overflown. In any instance where it is felt that an aircraft has breached the Rules of the Air the Irish Aviation Authority/DoD may be able to investigate the matter and, where it is appropriate, take legal/disciplinary action.

In the instance of a landing at Haulbowline the IAC will have assessed those approaches and perceived effects from the plume and have determined that there is a potential for the development restricting those approaches when the wind is from the south. However, the justification for the objection and the factors behind the IAC concerns warrant further examination.

DoD Observation

IAA Guidance

In their letter of objection the DoD refer to the IAA Air Accident Investigation Unit (AAIU) Report No. 001 – 2004 in which a helicopter suffered an engine flame out and was forced to make an emergency landing after accidentally flying through a chimney plume⁴. The DoD go on to state that a subsequent Aeronautical Information Circular (AIC) No 04/03 was issued requiring a pilot to assume a danger area around a chimney and up to 1000ft above a chimney.

It is worthy of note that the AIC was actually an Interim Safety Recommendation in 2003 and pre-dating the AAIU Final Report of 2004. That Final Report does not contain any such wording on danger areas or 1000ft avoidance but, again, highlights that pilots should be aware of the risk of engine flame outs when operating near power stations, forest fires, building fires oil/gas rigs etc. The Final Report does contain, at Appendix B, a copy of the AIC from 2003 but, in the version

⁴ <http://www.aaiu.ie/sites/default/files/upload/general/4571-0.PDF> - AAIU Synoptic Report No: 2004-001. Final Report dated 16/1/2004.

which WFAC have seen, there is no mention of any required vertical or horizontal separation distance commensurate with that specified in the DoD objection.⁵

The Final Report does state that:

“Encounter with gas plumes should not occur where the aircraft is otherwise in compliance with the Rules of the Air in relation to vertical and horizontal separation from structures.”

Federal Aviation Authority Guidance

In relation to the Federal Aviation Authority (FAA) Safety Risk Analysis which the DoD then refer to, further consideration is also required.⁶ In addition to the possible hazards identified by the FAA Flight Procedures Standards Branch and set out in the DoD objection letter it should be noted that the Risk Analysis Report goes on to say:

“...the safety risk analysis team performed their analysis of the predictive risks associated with the plumes and determined the effects of the hazards as low, or in the green sector of the risk matrix. As a result of this assessment the risk associated with plumes is acceptable without restriction, limitation, or further mitigation.”⁷

The team further identified that historical statistical data from within the United States illustrated that the accident/incident rate for **overflights** of exhaust plumes to be in the order of 10^{-9} or less against a desirable target level of safety of 10^{-7} ; the risk of an accident/incident caused by **overflights** of a plume was considered to be acceptably small and without the need for further restriction etc. (emphasis added in both cases). The team did conclude that, to further lower the already acceptable small risk associated with overflight of vertical plumes, overflight at less than 1000ft vertically above plume generating industrial sites should be avoided.

In a further Memorandum in 2015 the FAA reported on an ongoing study and published their updated guidance in the form of their Technical Guidance and Assessment Tool for Evaluation of Thermal Exhaust Plume Impact on Airport Operations⁸ in which they presented their

⁵ AAIU Synoptic Report No: 2004-001. Final Report dated 16/1/2004, Appendix B.

⁶ <http://www.ctcombustion.com/oxc/sources/20-safetyriskanalysis.pdf>. Federal Aviation Authority Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes, January 2006.

⁷ Federal Aviation Authority Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes, January 2006. Abstract, page ii.

⁸ FAA Memorandum, Technical Guidance and Assessment Tool for Evaluation of Thermal Exhaust Plume Impact on Airport Operations September 2015

modelling tool for consideration of potential for plume effects against aviation. Work on this tool and its conclusions have been presented separately but, for clarification, based on a worst case scenario any effects of the chimney at Ringaskiddy would be:

- Risk height for elevated temperature – **100 metres**
- Risk height for depleted oxygen – **70 metres**
- Risk height for severe turbulence – **50 metres**

In complying with the mandated Rules of the Air and remaining 150m clear of any person, vehicle, vessel or structure, and/or at a height less than 150 metres (500ft) above the ground or water, any aircraft operating in the vicinity of Ringaskiddy would, according to extant FAA Guidance be well clear of the stipulated distances for consideration of any possible effect from the plume.

If the approach into a southerly wind for aircraft operating at Haulbowline is considered further it is possible to provide additional clarification. The available imagery does not reveal the exact helicopter landing site within the naval base; there do not appear to be any standard helicopter landing site marking and nor are there any details for the landing site within available documentation. From photographs in the public domain of helicopters on the ground at Haulbowline it has, therefore, been assumed that the landing area is either at the centre of the parade ground to the north west of the circular building near the westerly extremity of the island or on the playing fields to the east of the island.

On Spike Island there is a faded Helicopter Landing Site marking evident in satellite imagery but it is understood that the island is now a local tourist attraction now and no longer used for official DoD activities.



Figure 1 – assumed helicopter landing positions at Haulbowline.

If this assumption on possible landing areas on the island is correct then the landing point is either approximately 1.16km from the proposed chimney (parade ground) or 1.33km from the proposed chimney (playing fields). According to FAA criteria/modelling then unless a pilot were to directly overfly the chimney, at what could be considered low level and in contravention of mandated Regulation, there should be no effect likely upon an aircraft.

Furthermore, any flight approach into a southerly wind will be from the north and will remain well clear of any plume at all times; any effects having dissipated well before the landing site.

In departing from the landing site to the south into wind the plume should not represent a hazard as the aircraft climbs well above and/or, presumably turns to either east or west to remain clear of the existing tall structures within the climb-out from the site.



Figure 2 – illustrative approach/departure from Haulbowline Island in southerly winds

In expressing concerns relating only to operations in southerly winds it has been assumed that the IAC have satisfied themselves that there would be no effects from winds from other directions.

Conclusions

WFAC have considered the DoD submission in relation to the proposed Ringaskiddy development.

The IAC would appear to have applied previous IAA and FAA guidance which has been superseded in both cases but which has persuaded the IAC of a need to apply much more stringent separation requirements that extant advice would require.

In accordance with FAA guidance and modelling the proposed chimney stack and any resultant plume should not affect operations to the Helicopter Landing Site at Haulbowline in southerly

winds; FAA modelling illustrates that any approach and climb-out should be well clear of any possible effects.

There is nothing within the mandated IAA Rules of the Air or the Federal Aviation Authority Guidance/modelling which would appear to support the IAC assertion that any helicopter approaches to the island would be made unsafe as a result of the operation of the chimney. Airmanship would dictate that, in any event and in common with any other vertical structure around the landing site, helicopters should not overfly the chimney.

PROFESSIONAL QUALIFICATIONS AND EXPERIENCE

Cdr Shane Savage BSc, RN (Retd)

In over 28 years in the Royal Navy Shane had over 25 years' experience in operational Air Traffic Control, (ATC), Fighter Control (FC) and Air Defence operations and Danger Areas Management. Having been awarded Helicopter Pilots' wings in 1986 he was employed at every level from operational controller, through training management, operational management, up to national and international policy and regulation as Head of ATC and FC and Danger Areas Regulation for the Royal Navy. Shane is now the Managing Director of Wind Farm Aviation Consultants Ltd, a consultancy set up specifically to advise the wind farm industry on aviation issues.

Experience and Qualifications

2010 – 2011 – Head of Aviation Operations Support for the Royal Navy

As the Head of Safeguarding for Royal Navy aviation infrastructure, Shane was responsible for Air Traffic Control, Aviation Operations Support and Fighter Control leadership, policy, regulation and service delivery at 4 airfields, 1 Area Radar Unit, 3 Aircraft Carriers and all RN operations throughout the world. Shane was responsible for the safe operation of all Naval Helicopter Landing Sites, Naval Danger Areas, Exercise Areas and Ranges and the examination and staffing of all RN issues both on and off shore.

2008 – 2010 Joint Air Land Organisation HQ Air Command (JALO) – Concepts and Doctrine for Air Land Integration

Shane was the MOD lead for the development and assurance of Forward Air Controller Close Air Support Tactics, Techniques and Procedures in addition to having lead responsibility for the development of air battlespace management doctrine and instructional courses to enhance safety in theatre and in training. As the UK representative to the US Joint Forces Command's Joint Fires Organisation he was responsible for the UK input on Air Battlespace Management. Additionally, he was UK representative to the US/NATO/Coalition Joint Close Air Support Executive Steering Committee with respect to Secure Data Links in Airspace Management.

2006 – 2008 Ministry of Defence, Whitehall, Directorate of Joint Capability (Intelligence Surveillance, Target Acquisition and Reconnaissance) with responsibility for Air Traffic Control Policy and ATC Equipment Procurement)

Shane was the MOD Policy lead and Joint User for Project Marshall, the Joint Military Air Traffic System. Further roles included being the MOD representative on the National IFF/SSR Committee and Chair of the Defence IFF/SSR Steering Committee with MOD Lead responsibility for Mode "S" SSR policy and equipage for both ground interrogators and airborne platforms. Other responsibilities included the MOD lead on the development of policy and regulation for Unmanned Air Systems airspace including design and implementation of the D122 complex in southern England. Single Service responsibilities included RN Policy lead for all aspects of MOD ATC and Airspace Policy in the 'Head Office'. This included MOD sponsorship of Joint Service Publication 552 (JSP 552), Military Air Traffic Service Regulations.

He was a member of the following regulatory and advisory bodies at varying times over the period:

CAA National Air Traffic Management Advisory Committee

CAA/MOD National Flight Safety Committee

UK AirProx Board

UK Air Safety Initiative Wind farms Working Group

CAA Danger Areas User Group

UK Airspace Strategy Steering Committee

MOD Airspace Requirements Review Team

National UK IFF and SSR Committee

Defence UK IFF and SSR Committee

MOD Wind farm Policy Group

Military Users Airspace Co-ordination Team

MOD Air Command and Control Programme Delivery Board

MOD ATC Aviation Safety Board

MOD Air Traffic Management Performance Criteria Working Group

MOD UAV Airspace Design Working Group

USA Joint Forces Command Executive Steering Committee on Air Battlespace Management, Close Air Support and Digital Data links

MOD Mode S Working Group

MOD/NATS Joint Future Airspace Design Team

MOD/CAA Flexible Use of Airspace Policy Group

Royal Navy lead for all aspects of Project Marshall, the MOD ATC replacement radar programme

2004 - 2006 Senior Air Traffic Controller (SATCO) RNAS Culdrose

At that time Culdrose was one of the busiest military mixed traffic airfields in Europe; Shane was responsible for all aspects of aviation operations support, including air traffic control, safety, crash fire and rescue, maintenance and service delivery. Culdrose was then the base for all Merlin, Seaking ASW, Jetstream and Hawk fast jet operations. It was (and is) equipped with a Watchman radar, Secondary Surveillance Radar (SSR), and a Precision Approach Radar (PAR).

2001 – 2004 Fleet Command Head Quarters – Staff Officer Air Traffic Control

As the “desk lead” for ATC and airspace management within the Fleet Headquarters Shane was responsible for ensuring every aspect of Royal Navy ATC and associated support functions, both ashore and afloat, and that these areas were able to deliver the necessary operational capability when and where required. Primary responsibilities included determining and implementing Royal Navy policy on Safety Management and Airfield and radar safeguarding. He was tasked with ensuring that ATC Standards and Practices, ashore and afloat, met with appropriate military and national procedures and safety regulations through continuous review of regulations and engagement with other ATC service providers and with ensuring policy compliance through regular informal visits and annual Formal Inspections to assure conformity of individual unit ATC service delivery. He represented the RN on the UK AIRPROX Board, UK Alternative Energy Committee, Inter-Service ATC Training, Safety Management and Airspace/ATC Policy Boards.

Prior to these last posts he had a varied history within airspace management within the full spectrum of ATC, airspace management, airspace training and delivery and operational RN Executive Officer employment including but not limited to:

1999 - 2001 – Senior Air Traffic Control Officer, Flag Officer Sea Training Plymouth Military Radar.

Sqn Ldr Mike Hale MBE MSc CFS RAF (Retd)

Mike has over 40 years piloting, instructing and examining experience around most of the globe ranging from numerous military fast jet aircraft including Lightning, Phantom and Tornado, through a range of civilian and military GA craft. For the last, to 7 years he has also acted as Chairman of a large military Gliding Club.

Mike's flying experience to date includes 9000 total flying hours including:

Lightning 1979 – 1986

Phantom 1986 – 1989

Jet Provost 1989 – 1991

Tornado 1991 – 2002

Chipmunk, Bulldog, Tutor.

in addition to various Qualified Warfare Instructor (QWI), Qualified Flying Instructor (QFI) Test Pilot (TP), qualifications. He is currently the Head of the Cranwell Gliding Club.

Over the last 8 years, in parallel to his flying duties he has held the post of MOD Air Staff Low Level Airspace Manager & Wind-Farm Subject Matter Expert. In this position he managed the UK low level airspace and assessed over 14,000 planning applications against low flying, weapons range, specialist airspace and aerodrome safeguarding criteria.

Mike has also managed two Air Staff Wind farm Flight Trials for the MOD, CAA, RUK and Trinity House.

Throughout his career he has been a member of the following committees and working groups:

- DIO Wind Energy Working Group - Pilot Member
- MOD Low Flying User Group - Chairman.
- MOD Airspace Review Committee.
- MOD Low Flying Safety Group
- MOD Low Flying Policy - Dep Chair

- AWR User Group - Dep Chair
- MUACTION - LF Member
- CANP-PINS - Chairman
- UK Air Prox Board - LF Advisor
- BGA/GSA - Exec Committee
- DTI/DEBERR/DECC Windfarm Working Groups & Airspace Allocation Committees
- Government Aviation Steering Group - Military Flying/Low Level Member.
- BHA ESC - Military Member.
- RUK/MOD Round Table Low Flying Member
- DAIEG & GEOSPATIAL Low Flying Member

In 2012 he was awarded an MBE for generating a proactive and mutually successful working relationship between the Wind Power Industry and the MOD Low Flying Operators.