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Technical Note

Hill of Lychrobbie Wind Farm

Aviation

EPower Ltd.

January 2021

Contents

Figures

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Version	Date	Reason
1.1	17/12/2020	First Draft
1.2	14/01/2021	Updated following review
1.3	15/01/2021	Final

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Executive Summary

This technical note supports EPower Ltd's (EPower) Section 42 Application to remove Condition 8 of the current planning permission in relation to the three turbine wind farm at the Hill of Lychrobbie, northeast of Dunbeath in the Highlands hereafter referred to as 'the Proposed Development'.

This technical note presents the results of an assessment of the likely impact of the Proposed Development on Ministry of Defence (MOD) aviation operations.

The findings are that the Proposed Development is not in an area of significance to RAF Lossiemouth operations or the provision of air traffic services using the RAF Lossiemouth Primary Surveillance Radar (PSR).

EPower has written to the MOD to present these assessment results and request that MOD engage with EPower relating the impact on the RAF Lossiemouth PSR. The Planning Condition and the MOD's comments on the Hill of Lychrobbie wind farm appear inconsistent with recent wind farm Planning Consents of nearby wind farms which are also expected to similarly affect the RAF Lossiemouth PSR.

The assessment finds that the inclusion of an agreed scheme of lighting for the Proposed Development WTG's, will mitigate any effects on military low-flying in the vicinity of the Proposed Development.

1 Introduction

1.1 Planning Background

The Hill of Lychrobbie Wind Farm is a consented three-turbine wind farm located south west of Wick in the Highlands. Planning Permission was granted by the Scottish Ministers at appeal on 26th January 2017 (DPEA reference PPA–270–2154, The Highland Council (THC) reference 13/04194/FUL) hereafter referred to as 'the Proposed Development'.

In January 2020, Atmos (on behalf of EPower) submitted a Section 42 application to THC to amend Condition 18 of this Planning Permission. This Section 42 application was granted, and a revised Planning Permission was issued by THC on 14th May 2020 (Reference: 20/00231/S42).

The report of handling for this Planning Permission[1] assessed whether the Proposed Development should be given a further three-year period to commence as, in effect, the granting of a Section 42 provides a 'new' permission and concluded the following in relation to aviation matters.

'One of the reasons for refusal of the original consent by the Planning Authority was that the MOD had objected to the application on the basis of detrimental impact on the RAF radar at Lossiemouth. This issue was addressed through the subsequent appeal through the submission of a technical proposal by the applicant. This allowed the MOD objection to be resolved however a condition was attached to require the submission of an Air Traffic Control Radar Mitigation Scheme to address the impact of the wind turbines air safety and specifically the radar system at Lossiemouth (condition 8). No information has been provided with this current application to demonstrate that the proposed technical solution remains appropriate in the context of the current wind farm/turbine position within this wider area. Therefore, there is further uncertainty in this regard and it is not clear if the issue remains suitably addressed'.

The Proposed Development consent is therefore subject to Condition 8 which is detailed further below:

No development shall commence unless and until an Air Traffic Control Radar Mitigation Scheme to address the impact of the wind turbines upon air safety has been submitted to and approved in writing by the Planning Authority in consultation with the Ministry of Defence.

The Air Traffic Control Radar Mitigation Scheme is a scheme designed to mitigate the impact of the development upon the operation of the Primary Surveillance Radar at RAF Lossiemouth ("the Radar") and the air traffic control operations of the Ministry of Defence (MOD) which is reliant upon the Radar. The Air Traffic Control Radar Mitigation Scheme shall set out the appropriate measures to be implemented to mitigate the impact of the development on the Radar and shall be in place for the operational life of the development provided the Radar remains in operation.

No turbines shall become operational unless and until all those measures required by the approved Air Traffic Control Radar Mitigation Scheme to be implemented prior to the operation of the turbines have been implemented and the Planning Authority has

[1] Delegated Report of Handling 20/00231/S42, dated 12 May 2020

confirmed this in writing. The development shall thereafter be operated fully in accordance with the approved Air Traffic Control Radar Mitigation Scheme.

Reason: *In the interest of air safety.*

1.2 Aim

This technical note therefore supports EPower Ltd's Section 42 Application to remove Condition 8 based on the results of an assessment of the likely impact of the Proposed Development on MOD operations in the area, in particular the Primary Surveillance Radar (PSR) system at Royal Air Force (RAF) Lossiemouth, and MOD flying operations in the vicinity of the Wind Turbine Generators (WTG).

It also makes comment on conditions 7 and 9 which related to aviation matter of the current planning permission.

2 Aviation Assessment

2.1 Proposed Development

The Proposed Development is located near Dunbeath, Caithness, and consists of three Wind Turbine Generators (WTGs) and associated infrastructure. The turbine coordinates are listed in Table 1 below all three have a hub height of 50m Above Ground Level (AGL) and a tip height of 73m AGL.

Table 1: Turbine Co-ordinates and height

Turbine Ref	Easting	Northing	Hub Height	Tip Height
Turbine 1	317067	932288	50.0 m	73.5 m
Turbine 2	317140	932179	50.0 m	73.5 m
Turbine 3	317205	932065	50.0 m	73.5 m

2.2 Scope of Assessment

This technical note reports on the results of an assessment of the likely impact of the Proposed Development on Ministry of Defence (MOD) operations in the area, in particular the Primary Surveillance Radar (PSR) system at Royal Air Force (RAF) Lossiemouth, and MOD flying operations in the vicinity of the Proposed Development Wind Turbine Generators (WTG). The impact on Meteorological radar systems is also included.

2.3 Aviation Baseline Environment

The airspace in the immediate vicinity of the Proposed Development is Class G Uncontrolled Airspace, where aircraft may fly when and where they wish, subject to the rules of the air.

Figure 1 below provides the location of the Proposed Development which is situated approx. 33 nautical miles (nm) due north, across the Moray Firth, from the RAF Lossiemouth Airfield Reference Point.

Figure 1 CAA VFR Chart extract showing airspace local to the Proposed Development WTGs

Source: Data included in this product reproduced under licence from NATS (Services) Ltd © Copyright 2020 NATS (Services) Ltd. All rights reserved.

The Proposed Development would be located within Low Flying Area (LFA) 14 and sits underneath a section of the Highlands Restricted Area (HRA; R610C) which extends from the ground surface to 2,000 feet (ft).

LFA 14 is an important area for military low flying activity; the airspace near the Proposed Development is considered by the MOD to be of a priority in terms of the UK Low Flying System (LFS).

Controlled Airspace (CAS) is established above Flight Level (FL) 195 where aircraft are required to operate under an Air Traffic Control (ATC) service.

2.4 Assessment

2.4.1 Effects on RAF Lossiemouth Air Traffic Control (ATC) Operations

The Proposed Development lies well beyond any physical obstruction surfaces safeguarding the RAF Lossiemouth and Kinloss Barracks aerodromes.

The WTGs are situated 62 kilometres (km) (approx. 33 nautical miles (nm)) from the RAF Lossiemouth Primary Surveillance Radar (PSR) system. A theoretical radar Line of Sight (LoS) analysis has been undertaken which confirms that the proposed WTGs theoretically will be detectable by the RAF Lossiemouth PSR. There is no terrain shielding between the PSR and the WTGs across the Moray Firth.

Figure 2 below shows the terrain elevation profile between RAF Lossiemouth PSR (left of the diagram) and the tips of WTG T1 (right of the diagram).

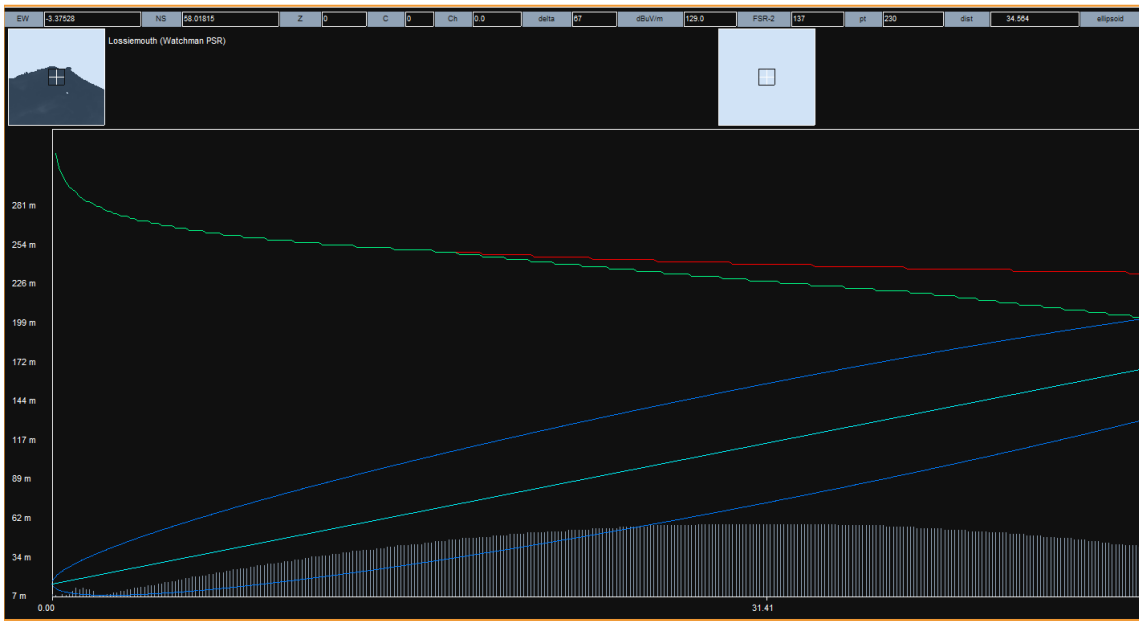
The grey shaded area is the terrain (in particular an expanse of water across the Moray Firth with no terrain features). The green straight line represents the radar signal traveling in a straight line from radar to WTG tip (taking into account earth curvature, refraction and other radar signal properties) the blue ellipse around the green line represents an area around the signal called the Fresnel Zone. The degree to which the Fresnel Zone is

blocked by terrain features is used to determine whether the radar signal reaches the WTGs or not.

This is a limited and theoretical desk-based study; in reality there are unpredictable levels of signal diffraction and attenuation within a given radar environment that can influence the probability of an operational WTG being detected.

This analysis is designed to give an indication of the likelihood of the WTGs being detected such that the operational significance of the Proposed Development areas relative to nearby aviation radar assets can be assessed.

Figure 2 RAF Lossiemouth PSR LOS and terrain elevation profile to WTG T1



Source: Advanced Topographic Development and Imaging (ATDI) ICS LT (Version 22.4.7 x64) tool.

The assessment determines that all three WTGs are potentially detectable by the RAF Lossiemouth PSR. The WTGs are therefore likely to present an area of clutter on the radar display; however, the clutter is in a location deemed not to be of operational significance to RAF Lossiemouth, per se, the clutter does not conflict with known flight procedures (defined nominal tracks flown by aircraft on approach) or radar vectoring areas at the airfield.

RAF Lossiemouth ATC are likely to offer various radar services to aircraft flying outside and inside CAS up to Flight Level (FL) 100 (approx. 10,000 ft) in that area; this service is provided at the discretion of air traffic controllers when capacity allows, and from this assessment it is concluded that the effects on this service will be insignificant.

It is worth noting that the nearby Bad Fearn wind farm has not received an objection from the MOD regarding RAF Lossiemouth PSR LOS despite having a similar terrain elevation profile between the radar and the WTGs. The Bad Fearn wind farm is also considered to be in an area of insignificance to RAF Lossiemouth operations.

2.4.2 Effects on Military Low Flying Operations

The effects on military low flying operations in LFA 14 are limited to the potential that a pilot fails to identify the WTG obstruction. EPower are committed to complying with the

notification requirements of Planning Condition 7 to ensure that the location and parameters of the Proposed Development WTG's (including the lighting status) will be marked on aeronautical charts and promulgated in the relevant aeronautical information publications. Pilots are responsible for planning their flight, including the identification of any enroute obstacles, and for identifying and avoiding those obstacles during the flight. Recognising that military low flying operations take place at night, and in accordance with Planning Condition 9, EPower are committed to a lighting scheme for the WTGs with MOD will address any residual effects.

2.5 Consultation with MOD

EPower has written to the MOD to present these assessment results and request that MOD engage with EPower to discuss the impact on the RAF Lossiemouth PSR.

The Planning Condition and the MOD's comments on the Proposed Development appear inconsistent with recent wind farm planning consents of nearby wind farms which have RAF Lossiemouth PSR LoS.

2.6 Met Weather System Infrastructure

In recent consultation responses, the MOD raised a potential issue with Met Office Radar. The Proposed Development is not within any consultation zones associated with Met Office Infrastructure and would therefore have no significant effect on meteorological radar.

3 Conclusions

The Proposed Development is theoretically visible to the RAF Lossiemouth PSR, however the resultant clutter associated with turbines is not considered to be located within an area of operational significance to the airfield. The nearby Bad Fearn wind farm has not received an objection from MOD despite consisting of a greater number of wind turbines of increased tip height compared to the Proposed Development.

It is considered that the requirement for a radar mitigation scheme is disproportionate relative to the impact on airfield operations and is inconsistent with the approach taken by MOD for nearby developments. Therefore, EPower are seeking to have Condition 8 removed.

Hill of Lychrobbie Wind Farm

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Figure 3
Ministry of Defence
Aviation Constraints

Key

- Consented Hill of Lychrobbie turbine location (74m tip height)
- Proposed Dunbeath turbine location (180m tip height)

MoD Low Flying Zones

- High priority military low flying area likely to raise considerable and significant concerns.
- Regular military low flying area where mitigation may be necessary to resolve concerns.
- Low priority military low flying areas less likely to raise concerns.

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