Seagreen Wind Energy Limited

Seagreen Offshore Wind Farm
Gateway documentation:
Stage 4B

Airspace Change Proposal

Table 1: Publication history

Issue	Month/Year	Change Requests in this issue
V1.0	Oct 2019	Issued
V1.1	Nov 2019	Clarification around Controlling Authority; text amended in sections 7.2; Annex 15.3 Procedure allowing traversing of TMZ by non-transponder aircraft removed from document. Sections 7.3, 7.4, 7.5
V1.2	Nov 2019	Addition of Aberdeen Radar details to Draft AIP in Annex 15.3
V1.3	Jan 2020	Amended Aberdeen Radar frequency in Draft AIP: Annex 15.3

Table 2: Production roles

Action	Role	Date
Produced	Airspace Change Specialist	22/10/2019
Reviewed Approved	Manager Airspace Change Compliance & Delivery	22/10/2019
Reviewed Approved	Wind Turbine Generation Package Manager	25/10/2019

1. Contents

2. Introduction

2.1 Seagreen Wind Energy Limited (SWEL) is intending to develop an offshore wind farm in the North Sea. In total, the proposed windfarm will cover an area of approx. 400km^2. The site is located around 27km from the Angus coastline, with offshore consent for this project granted in 2014.

2.2 Wind turbines can interfere with air traffic control radars. Detection on the radar would have the potential to cause false radar returns to be displayed to an Air Traffic Controller. This radar "clutter" could obscure primary returns from actual aircraft and could also interfere with radar tracking. This could affect an air traffic controller's ability to identify primary radar aircraft returns and increases the risk of the controller not detecting a conflict between aircraft. Large numbers of turbines could also lead to saturation of the radar processing systems.

2.3 Radar Blanking (or Radar Range Azimuth Gating (RAG)) is the proposed solution to be deployed over the area of the wind farm before it is constructed, to prevent primary radar detection from the turbines. However, radar blanking will also remove primary radar returns of aircraft within the blanked area. As such, a Transponder Mandatory Zone (TMZ) will need to be established in the same area so that aircraft will be visible to ATC using secondary surveillance radar (SSR).

2.4 The changes in this ACP only impact flights over the high seas (14.6nm offshore). Hence, in accordance with the Levels as defined in CAP1616, CAA has categorised this proposal as a Level 2B change. In line with the requirements for a Level 2B change, the environmental impact assessment has been conducted on the basis of CO_2 emissions only. There would be no perceptible change to noise impacts to stakeholders on the ground; hence no noise analysis has been undertaken; equally, there will be no discernible change in impact on tranquillity or biodiversity.

2.5 Previous documents (Refs 4, 5, 6 and 7) have reduced the number of design concepts being considered to just one. This option can be summarised as follows:

TMZ aligned to smoothed/rounded off boundary plus 2nm buffer (Option D)
Associated with RAG blanking and assessed to be the optimum solution to mitigate the impact of the wind turbine generators (WTGs) on the Perwinnes radar system, this will provide:

- Effective suppression of all primary radar clutter associated with the WTGs.
- Promulgation of a TMZ over the RAG blanked area will ensure that aircraft within the TMZ area must be transponder equipped and hence will be visible to ATC via secondary radar.
- The dimensions of the TMZ include a 2nm buffer which is adequate to ensure that ATC have sufficient time to identify when an infringement of the TMZ is taking place and take appropriate action.
- The proposed Option D (TMZ coupled with radar RAG blanking) provides effective and safe mitigation against the radar issues associated with WTGs.

2.6 If the proposal is approved by the CAA, the proposed design would be implemented in March 2021.

3. Executive Summary

To facilitate the change summarised above, SWEL developed a number of relevant design principles; used these to evaluate design options; and further analysed the leading option.

SWEL created a consultation strategy to identify, engage and target specific stakeholders; launched & completed a focused consultation; and finally, assessed and analysed the thirteen consultation responses submitted by fourteen stakeholders – please see the table of references on Page 18 for links to the relevant documents.

As covered in the Stage 3 Step 3D Collate and Review Responses document (Ref 11), there were two response elements identified as having the potential to impact the proposed design. Following assessment, both were rejected, and the proposed design was not revised. This is all detailed in the Stage 4 Step 4A Update Design document (Ref 12).

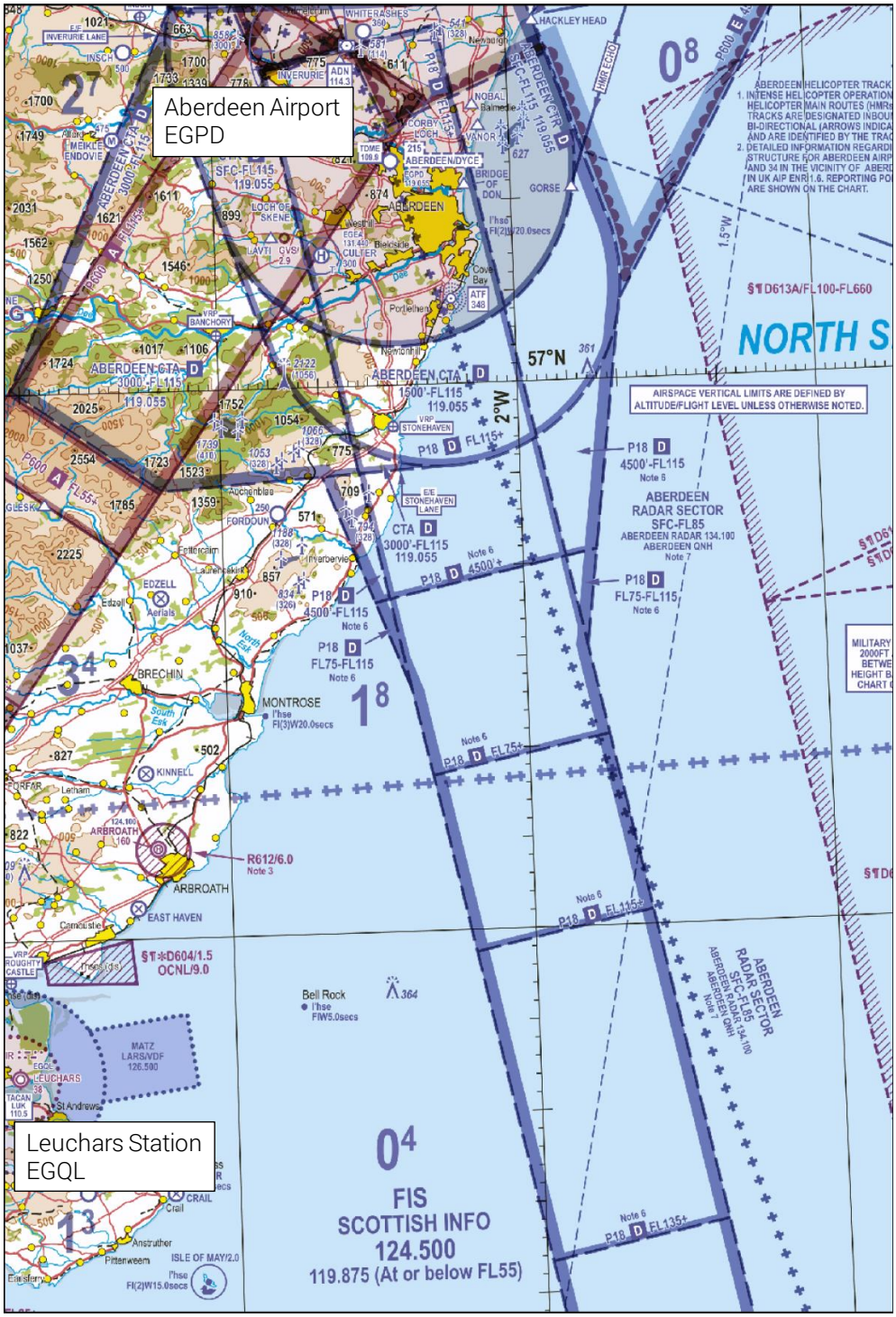
4. Current Airspace Description

4.1 Structures and Routes

The windfarm is proposed to cover an area of approx. 400km^2. The proposed airspace change would include this entire area, with an additional 2 nautical mile (nm) buffer.

This airspace is Class G uncontrolled, but with air traffic service (ATS) routes nearby (mainly used for Aberdeen Airport arrivals/departures) and a Danger Area located to the east, known as EGD613. See Figure 1 below:

Figure 1: Current Airspace arrangements



4.2 Operational efficiency, complexity, delays and choke points

There are no proposed changes to air traffic patterns so there will be no impact for operational efficiency, complexity, delays and choke points.

4.3 Safety issues

There are no current safety issues within the relevant areas of airspace. If the wind farm were constructed and no mitigation against radar clutter/interference were implemented, this would have the following impacts:

- WTGs cause clutter on radar displays (150 WTGs in the wind farm)
- The clutter would make ATC tracking and identification of non-transponder equipped aircraft in the cluttered area impossible
- The clutter makes ATC tracking and identification of transponder equipped aircraft in the cluttered area difficult due to obscuring.
- Interference and saturation of radar processing due to excessive radar returns can degrade radar performance across the whole operating area of the radar.

Due to the above impacts the suspensive Condition 23 requires that appropriate mitigation is put in place. Hence the 'do nothing' is not a viable option.

4.4 Environmental issues

There are no specific environmental issues within the relevant areas of airspace, in the current operation. However, as planning is subject to Section 36 Planning Consent Condition 23 due to the impact of this development on the Perwinnes PSR, it would not be possible to build the windfarm in the current airspace without appropriate mitigation in place. This would prohibit the significant CO_2 benefits which the windfarm will realise.

5. Statement of Need

The following text is from the DAP1916 Statement of Need form, as submitted in April 2019:

Current Situation:

Seagreen Wind Energy Ltd (SWEL) has planning consent to develop Phase 1 of a substantial offshore wind farm off the East Scotland coast approx. 23 nautical miles east of Arbroath. Planning consent was awarded by Scottish Ministers in 2014 but progression of the development was held up by a Judicial Review following which planning consent was confirmed in November 2017.

Issue or opportunity to be addressed and the cause:

As part of the planning process, SWEL has engaged with all relevant aviation stakeholders to determine the impact of Seagreen Phase 1's wind turbines on aviation radar systems and operations. In particular, National Air Traffic Services En-Route PLC (NERL) has confirmed that the development will have an adverse impact on their ability to provide Air Traffic Services (ATS) in the vicinity of Seagreen Phase 1. As a result, SWEL has agreed with NERL that the planned wind farm development should not be built until a suitable mitigation has been established.

Action:

SWEL has employed Coleman Aviation Ltd to investigate potential impacts of wind turbines on NERL and other aviation stakeholder operations. Discussion with NERL has suggested that the Airspace Change Process (CAP 1616) should be initiated in order to manage the development of airspace-related mitigation options.

Seagreen Wind Farm Phase 1 is a strategically important offshore wind farm development and SWEL require the mitigation options to be investigated and understood prior to funding decision in Q4 2019. As a result, SWEL are keen that the Airspace Change Process is initiated as soon as possible.

6. Proposed Airspace Description

6.1 Objectives/Requirements for Proposed Design

The primary objective for this proposed airspace change is to enable the construction of the windfarm. This windfarm development is considered as a Nationally Significant Infrastructure Project (NSIP) by the UK Government's Business, Energy and Industrial Strategy (BEIS) department. The environmental benefit of the windfarm is expected to produce CO_2 benefits of 2 million tonnes per annum, which will only be realised if the airspace change is implemented and the windfarm can be built.

The objectives of this proposal are to:

- Ensure aviation safety, and no increased risk to Air Traffic Controllers' ability to detect aircraft conflictions; and
- Meet the planning consent condition for this windfarm development to enable its construction and realise significant environmental benefits by the generation of renewable energy[1]

6.2 Proposed New Airspace and Usage

The proposed changes are for a radar blanking volume (inner) with Option D TMZ boundary (outer) from surface to FL100 as shown in 6.4 Figure 2.

The proposed windfarm is located 40nm south-southeast of Aberdeen Airport and 32nm east-northeast of RAF Leuchars Station. The western portion sits underneath Airway P18 (Class D, transponder mandatory airspace); the eastern boundary is adjacent to, and underneath, Danger Area D613C.

Its vertical extent would be from the surface to FL100 because all civilian aircraft must operate a transponder from FL100 and above (ref UK AIP ENR 1.6 para 2.2.2.1).

The proposed shape is simplified compared with the inner radar blanking region, with a 2nm smoothed buffer. The buffer is intended to give ATC some delay (and hence time to react) should an infringement occur:

- An example non-transponding infringing aircraft travelling at 200kt will take c.36 seconds from crossing the proposed TMZ perpendicular to the boundary, until it enters the blanked region (and disappears). An air traffic controller monitoring the radar would have that time to notice the aircraft has infringed the TMZ and take appropriate action.

The simplified TMZ boundary shape is advantageous for the simplicity of display to pilots on in-cockpit electronic flight information system (EFIS) displays and ATC operators on radar displays. A simple shape is preferable for Human Factors reasons. This reasoning was used in previous wind farm TMZ mitigations to design the outer TMZ boundary and has been effective.

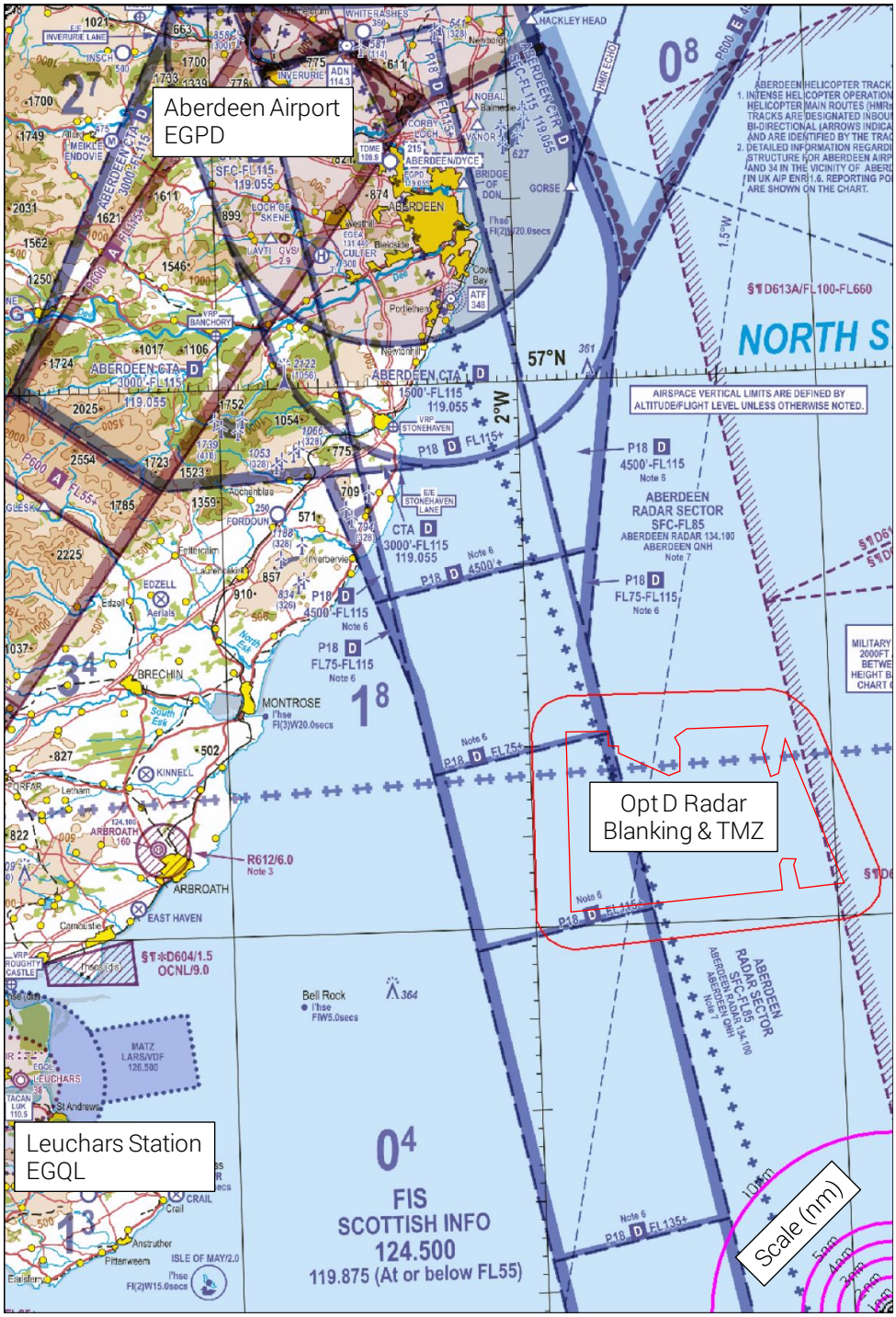
6.3 Changes between Consultation and Final Proposal

There are no changes to the final proposal as a result of the consultation, as described in the Stage 4 Step 4A Update Design document (Ref 13).

The draft AIP changes with TMZ coordinates for the proposed TMZ area are in Annex 15.3.

[1] Planning was granted, subject to Section 36 Planning Consent Condition 23, which states that no turbine shall be erected until a Primary Radar Mitigation Scheme has been implemented, due to the impact of this development on the Perwinnes PSR.

6.4 Figure 2 Proposed Airspace - TMZ Option D (outer shape)



7. Impacts and Consultation

SWEL completed engagement activities with stakeholders identified as those being most likely to be affected by the proposed design. These targeted stakeholders are listed in Annex Section 15.2. SWEL engaged with the key stakeholders on the planned changes through meetings and email exchanges. The Consultation Strategy Document (Ref 8) details all the engagement activities completed prior to the consultation going live.

SWEL commenced a focused consultation on these proposed airspace changes on Wednesday 4th September 2019. The consultation was conducted via an online portal where users could submit a formal response alongside viewing the Consultation Document (Ref 10). The consultation document provides information on how the consultation was administered; an overview into the current airspace; the proposed changes and impacts of the proposed changes.

The consultation was open for six weeks; closing on Wednesday 16th October 2019. A total of fourteen responses were received during this period; which are covered in the following sections. A full summary of how the consultation was run and assessment of responses can be found in the Stage 3 Step 3D Collate and Review Responses Report (Ref 11).

7.1 Net impacts summary

Category	Impact	Evidence
Safety/Complexity	No impact on complexity. There would be significant safety issues should no mitigation be in place and the wind farm be constructed.	See Sections 4.2 and 4.3
Capacity/Delay	No impact on capacity or delay.	See Section 4.2
Fuel Efficiency/CO_2	No impact for commercial airlines. Negligible impact for GA users.	See Section 7.7
Noise – Leq/SEL	No impact	See Section 7.8
Tranquillity, visual intrusion (AONBs & National Parks)	No impact	See Section 7.8
Local Air Quality	No impact	See Section 7.8
Other Airspace Users	This proposal would require all aircraft entering the area to be transponder equipped. All affected users and stakeholders have been engaged and consulted with.	See Sections 7.2 to 7.6

7.2 Units affected by the proposal

This section determines the likely impact on operations based on consultation responses and operational analysis.

There will be no impact on any aircraft operations at levels above FL100 as above FL100 transponder carriage is mandatory and for this reason the TMZ ceases at FL100.

ATC services are provided in this region by Aberdeen Radar, RAF Leuchars and Scottish FIS. As the TMZ is in Class G Airspace there is no defined Controlling Authority for the Seagreen TMZ.

During Stage 1 of this process, eighteen Design Principles were agreed with the CAA. These can be found in the Stage 1 Step 1B Design Principles document (Ref 4). One Design Principle states 'Airspace change will maintain or enhance operational resilience of the ATC network'.

SWEL engaged with NATS (NERL) (ANSP) and Aberdeen Airport early in the design development work, particularly in relation to Aberdeen arrivals/departures and offshore helicopter activity in the vicinity of the

Seagreen Offshore Wind Farm. NATS and Aberdeen Airport were both engaged and consulted with as key stakeholders. They have been involved throughout the entire design process.

NATS (NERL) responded to the consultation stating that they support the proposed changes, and they were satisfied this would meet the required mitigation for the Perwinnes Radar, thus maintaining operational resilience and safety.

Aberdeen Airport responded to the consultation stating they were happy with the creation of the TMZ and radar blanking.

Consultation response was also received from Dundee Airfield. Dundee confirmed their understanding of the proposed changes, which they stated would not affect their operations under its current configuration and activity.

Three local helicopter operators responded. Two indicated support (Bristow Helicopters and Babcock International), and one stated they had no objection to the proposal (NHV Helicopters).

An objection was received from Highlands & Islands Airport Limited (HIAL). They highlighted that the proposed development of Air Traffic Management across the Highlands & Islands seeks to operate with primary radar only, and therefore a lack of SSR cover in this area may require mitigation in the future. This was rejected due to it being a potential impact to radar services that don't yet exist.

All consultation feedback is summarised in the Stage 3 Step 3D Collate and Review Responses document (Ref 11) and the action we took on that feedback can be found in the Stage 4 Step 4A Update Design document (Ref 12).

7.3 Access by Non-transponder Equipped Aircraft

Non-transponder equipped aircraft would need to reroute to avoid the TMZ if they are unable to comply with it's conditions.

7.4 Military impact and consultation

One Design Principle states that the 'airspace change will be compatible with the requirements of the MoD (if required)'.

It is considered that there will be no adverse impact on military and public transport flights (including offshore helicopter operations) as these categories of aircraft are transponder equipped.

In the event of transponder failure pilots will need to reroute around the TMZ as per paragraph 7.3.

There may be a need to limit the types of military training undertaken in the TMZ as high energy manoeuvres may cause SSR contacts to be temporarily lost.

The MoD was consulted as a key stakeholder via DAATM; specifically, in relation to the impact the proposed changes would have on maintaining their current level of flexibility in conducting military aviation operations. The MoD have been engaged and consulted with, throughout the entire design process.

The MoD responded to the consultation with three requirements relating to extant processes between MoD and SWEL, none of which could potentially change the proposal.

All consultation feedback is summarised in the Stage 3 Step 3D Collate and Review Responses document (Ref 11) and the action we took on that feedback can be found in the Stage 4 Step 4A Update Design document (Ref 12).

7.5 General Aviation airspace users impact and consultation

One Design Principle states that 'the impacts on GA and other civilian airspace users will be minimised.' It is considered that there will be no adverse impact on general aviation as the majority of GA aircraft operating over the sea will be transponder equipped. The potential impact to GA users would affect those who fly without a transponder. This is assessed to be less than 1% of traffic in this area (Ref 9), who will be required to reroute around the TMZ as per 7.3.

NATMAC members were engaged and many felt there would be no impact and they would not need to be consulted further. Of those consulted, responses were received from ARPAS-UK, the Honourable Company of Air Pilots, and the British Microlight Aircraft Association (BMAA), none of whom objected to the proposal.

An objection was received from a microlight/GA pilot, with several elements raised. The response to this can be seen in the Stage 3 Step 3D Collate and Review Responses document (Ref12).

7.6 Commercial air transport impact and consultation

SWEL has engaged and consulted directly with airline operators who were identified as being relevant carriers within the associated area of airspace; this was completed through the NATMAC as listed in Annex A of the Stage 3 Step 3A Consultation Strategy document (Ref 8).

No consultation responses were received from airlines.

7.7 CO_2 environmental analysis impact and consultation

The introduction of the wind farm is anticipated to provide CO_2 benefits of 2 million tonnes per annum[2], which is a wider benefit enabled by, but not directly attributable to, this proposal.

There is no expected change to fuel burn for commercial airlines as flight plannable route will remain unchanged and they are all transponder equipped. GA users may theoretically incur increased fuel burn if they are not equipped and forced to route around the TMZ. However, the likely volume of non-transponder equipped aircraft which may pass through this area and any potential increase in fuel burn as a result would be negligible. (Ref 9).

7.7.1 Design differences since consultation

There are no changes made to the design as a result of the consultation, or since consultation completed.

7.8 Local environmental impacts and consultation

As the proposal is offshore approx. 27km from the Angus coast and a Level 2B change, there are no local environmental impacts such as noise, visual intrusion, tranquillity or local air quality. NATS did not target organisations whose primary interest is environmental impacts.

7.9 Economic impacts

The development of this airspace change proposal has not been informed by any economic constraints or opportunities. All costs relating to implementation and adaptation are being met by the developer. Should the airspace change be implemented and the wind farm be built, the 2 million tonnes of CO_2 benefit per annum would be significant (Ref 7).

8. Analysis of Options

8.1 Airspace Change Design Options

SWEL initially identified one proposal for mitigating the radar clutter associated with wind farm turbines (Ref 5) (radar blanking with TMZ), with four options as to how it could be implemented, and a 'do nothing' option. The four options were:

Option A: TMZ in line with proposed wind turbine locations

Option B: TMZ in line with proposed wind turbine locations plus 2nm buffer

Option C: Simplified polygon TMZ "rubber banded" around proposed wind turbine locations with no buffer

Option D: TMZ aligned to smoothed/rounded off boundary plus 2nm buffer

8.2 Design Options Assessment

The options were evaluated against the design principles (Ref 4,7). All options had the same impacts on communities and stakeholders, although two of the options (B and D) had no impact on capacity/resilience and

[2] See www.seagreenwindenergy.com/benefit as estimated by the developer at time of writing

the other two options represented a reduction. To do nothing would prevent the construction of the wind farm and therefore the realisation of substantial CO_2 benefits.

SWEL specified a preferred solution, termed Option D, which was a TMZ aligned to smoothed/rounded off boundary plus 2nm buffer. A full options appraisal was completed for this solution, which confirmed the option was best to provide safe and effective mitigation against the radar issues associated with WTGs. This was the only option carried forward for consultation.

The consultation resulted in two elements which suggested changes to the design; neither of these were progressed. A full summary of the consultation (Ref 10), the feedback received (Ref 11) and how proposed changes given in feedback were evaluated (Ref 12) are described in the associated references.

The final design is hereby submitted because it best meets the design principles.

9. Airspace Description Requirements

	The proposal should provide a full description of the proposed change including the following:	Description for this proposal
a	The type of route or structure; for example, airway, UAR, Conditional Route, Advisory Route, CTR, SIDs/STARs, holding patterns, etc	TMZ (Section 2) See Section 6.4 for proposal area. Draft AIP (Annex 15.3)
b	The hours of operation of the airspace and any seasonal variations	H24
c	Interaction with domestic and international en-route structures, TMAs or CTAs with an explanation of how connectivity is to be achieved. Connectivity to aerodromes not connected to CAS should be covered	No impact on current connectivity
d	Airspace buffer requirements (if any). Where applicable describe how the CAA policy statement on 'Special Use Airspace – Safety Buffer Policy for Airspace Design Purposes' has been applied.	N/A – this proposal does not change any existing/introduce new buffers
e	Supporting information on traffic data including statistics and forecasts for the various categories of aircraft movements (passenger, freight, test and training, aero club, other) and terminal passenger numbers	N/A - This proposal would have no impact on airspace usage – see Section 7
f	Analysis of the impact of the traffic mix on complexity and workload of operations	N/A - This proposal would have no impact on the traffic mix – see Section 4.2
g	Evidence of relevant draft Letters of Agreement, including any arising out of consultation and/or airspace management requirements	N/A – this proposal does not change any existing/ introduce new LOAs; cross-border elements are not impacted.
h	Evidence that the airspace design is compliant with ICAO Standards and Recommended Practices (SARPs) and any other UK policy or filed differences, and UK policy on the Flexible Use of Airspace (or evidence of mitigation where it is not)	TMZ to be implemented as per Regulation (EU) No. 923/2012
i	The proposed airspace classification with justification for that classification	No changes to existing CAS volumes or classifications.
j	Demonstration of commitment to provide airspace users equitable access to the airspace as per the classification and where necessary indicate resources to be applied or a commitment to provide them in line with forecast traffic growth. 'Management by exclusion' would not be acceptable	See section 7.3 – 7.7
k	Details of and justification for any delegation of ATS	No change to the delegation of ATS

10. Safety Assessment

There is an overriding safety Design Principle which states that the airspace change should maintain or enhance current levels of safety. Initial qualitative assessment from NATS Safeguarding has confirmed that the proposed Option D TMZ design would provide adequate mitigation to fulfil the requirements of the NERL Perwinnes: PSR Mitigation Scheme.

There is also a Design Principle that airspace change should be subject to the approval of a NATS safety assessment. NATS' first priority is safety (and transparently demonstrating its commitment to safety), hence the requirement for this airspace change to mitigate safety concerns. A detailed safety analysis will be undertaken in due course.

This proposal will provide:

- Effective suppression of all primary radar clutter associated with the WTGs
- The promulgation of a TMZ over the RAG blanked area will ensure that aircraft within the TMZ area must be transponder equipped and hence will be visible to ATC via secondary radar.
- The dimensions of the TMZ include a 2nm buffer which is adequate to ensure that ATC have sufficient time to identify when an infringement of the TMZ is taking place and take appropriate action.

Experience from previous wind farm developments has demonstrated that the implementation of radar RAG blanking coupled with an associated TMZ provides effective and safe mitigation against the radar issues associated with WTGs.

11. Operational Impact

	An analysis of the impact of the change on all airspace users, airfields and traffic levels must be provided, and include an outline concept of operations describing how operations within the new airspace will be managed. Specifically, consideration should be given to:	Evidence of compliance/ proposed mitigation
a	Impact on IFR general air traffic and operational air traffic or on VFR General Aviation (GA) traffic flow in or through the area	Minimal impact affecting only those aircraft flying without a transponder – sections 7.3, 7.5
b	Impact on VFR operations (including VFR routes where applicable);	No impact on VFR operations.
c	Consequential effects on procedures and capacity, i.e. on SIDs, STARs, and/or holding patterns. Details of existing or planned routes and holds	No impact on procedures or capacity – see section 6.2
d	Impact on aerodromes and other specific activities within or adjacent to the proposed airspace	No impact on aerodromes or other relevant activities
e	Any flight planning restrictions and/or route requirements	Only Transponder equipped aircraft permitted to enter the airspace.

12. Supporting Infrastructure/ Resources

	General requirements	Evidence of compliance/ proposed mitigation
a	Evidence to support RNAV and conventional navigation as appropriate with details of planned availability and contingency procedures	N/A
b	Evidence to support primary and secondary surveillance radar (SSR) with details of planned availability and contingency procedures	Primary radar will be blanked to prevent clutter from the wind farm. Implementation of the TMZ is to ensure SSR coverage. Section 6.2
c	Evidence of communications infrastructure including R/T coverage, with availability and contingency procedures	Traffic uses the same regions as today in a similar manner from a comms infrastructure point of view. Demonstrably adequate for the region.
d	The effects of failure of equipment, procedures and/or personnel with respect to the overall management of the airspace must be considered	Existing contingency procedures and management protocol will continue to apply as today.
e	Effective responses to the failure modes that will enable the functions associated with airspace to be carried out including details of navigation aid coverage, unit personnel levels, separation standards and the design of the airspace in respect of existing international standards or guidance material	As above (12d)
f	A clear statement on SSR code assignment requirements	No change
g	Evidence of sufficient numbers of suitably qualified staff required to provide air traffic services following the implementation of a change	No training or additional qualifications required.

13. Airspace and Infrastructure

	General requirements	Evidence of compliance/ proposed mitigation
a	The airspace structure must be of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and non-radar environments	The proposed TMZ is designed to be as small as possible. See section 6.
b	Where an additional airspace structure is required for radar control purposes, the dimensions shall be such that radar control manoeuvres can be contained within the structure, allowing a safety buffer. This safety buffer shall be in accordance with agreed parameters as set down in CAA policy statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace'. Describe how the safety buffer is applied, show how the safety buffer is portrayed to the relevant parties, and provide the required agreements between the relevant ANSPs/ airspace users detailing procedures on how the airspace will be used. This may be in the form of Letters of Agreement with the appropriate level of diagrammatic explanatory detail.	The TMZ has a 2nm buffer, intended for additional safety for ATC. See Section 6.2
c	The Air Traffic Management system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures	Promulgation of the TMZ will ensure that surveillance of aircraft is effective such that separation between aircraft can be maintained.
d	Air traffic control procedures are to ensure required separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures	No change to ATC procedures.
e	Within the constraints of safety and efficiency, the airspace classification should permit access to as many classes of user as practicable	No change to airspace classification. The Transponder Mandatory restriction is designed to permit access to as many classes of airspace user as practicable.
f	There must be assurance, as far as practicable, against unauthorised incursions. This is usually done through the classification and promulgation	The addition of the 2nm buffer is designed to identify and act against any infringing aircraft. Section 6.2
g	Pilots shall be notified of any failure of navigational facilities and of any suitable alternative facilities available and the method of identifying failure and notification should be specified	Existing contingency procedures would continue to apply.
h	The notification of the implementation of new airspace structures or withdrawal of redundant airspace structures shall be adequate to allow interested parties sufficient time to comply with user requirements. This is normally done through the AIRAC cycle	This change will be promulgated by AIRAC as per the typical cycle schedule.
i	There must be sufficient R/T coverage to support the Air Traffic Management system within the totality of proposed controlled airspace	Traffic uses the same regions as today in a similar manner from a comms infrastructure point of view. Demonstrably adequate for the region. See item 12 c.
j	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered	N/A
k	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site, etc) in the vicinity of the new airspace structure and no suitable operating agreements or air traffic control procedures can be devised, the change sponsor shall act to resolve any conflicting interests	Should this occur, we would act appropriately and expeditiously.

	ATS route requirements	Evidence
a	There must be sufficient accurate navigational guidance based on in-line VOR/DME or NDB or by approved RNAV derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol standards	N/A
b	Where ATS routes adjoin terminal airspace there shall be suitable link routes as necessary for the ATM task	As today – there are no new link routes required as part of this proposal.
c	All new routes should be designed to accommodate P-RNAV navigational requirements	N/A – no new routes

	Terminal airspace requirements	Evidence of compliance/ proposed mitigation
a	The airspace structure shall be of sufficient dimensions to contain appropriate procedures, holding patterns and their associated protected areas	As today - no procedures within the proposed area.
b	There shall be effective integration of departure and arrival routes associated with the airspace structure and linking to designated runways and published instrument approach procedures (IAPs)	As today - no proposed changes affecting departure and arrival routes and published IAPs.
c	Where possible, there shall be suitable linking routes between the proposed terminal airspace and existing en-route airspace structure	As today – no changes proposed.
d	The airspace structure shall be designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace	As today - no change to the airspace structure.
e	Suitable arrangements for the control of all classes of aircraft (including transits) operating within or adjacent to the airspace in question, in all meteorological conditions and under all flight rules, shall be in place or will be put into effect by the change sponsor upon implementation of the change in question (if these do not already exist)	No change to the classification of airspace (remains Class G). Extant procedures for ATSOCAS apply.
f	The change sponsor shall ensure that sufficient visual reference points are established within or adjacent to the subject airspace to facilitate the effective integration of VFR arrivals, departures and transits of the airspace with IFR traffic.	The WTGs will be distinctive and recognisable visual reference points creating an easily identifiable visual reference to identify the TMZ area.
g	There shall be suitable availability of radar control facilities	As today - no change to radar control facilities.
h	The change sponsor shall, upon implementation of any airspace change, devise the means of gathering (if these do not already exist) and of maintaining statistics on the number of aircraft transiting the airspace in question. Similarly, the change sponsor shall maintain records on the numbers of aircraft refused permission to transit the airspace in question, and the reasons why. The change sponsor should note that such records would enable ATS managers to plan staffing requirements necessary to effectively manage the airspace under their control	This will be undertaken as part of the PIR under CAP 1616
i	All new procedures should, wherever possible, incorporate Continuous Descent Approach (CDA) profiles after aircraft leave the holding facility associated with that procedure	As today – no new procedures.

	Off – route airspace requirements	Evidence of compliance/proposed mitigation
a	If the new structure lies closes to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered.	N/A
	Should there be any other aviation activity (military low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or air traffic control procedures can be devised, the change sponsor shall act to resolve any conflicting interests	Should this occur, we would act appropriately and expeditiously.

14. Environmental Assessment

	Theme	Content	Evidence of compliance/ proposed mitigation
a	WebTAG analysis	Output and conclusions of the analysis (if not already provided elsewhere in the proposal)	Not required due to negligible impact. See 3.7.1 in 3A Full Options Appraisal (Ref 9)
b	Assessment of noise impacts (Level 1/M1 proposals only)	Consideration of noise impacts, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no noise impacts, the rationale must be explained	N/A - environmental analysis requirements scaled equivalent to a Level 2 change, see Section 7.7.
c	Assessment of CO_2 emissions	Consideration of the impacts on CO_2 emissions, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no impact on CO_2 emissions impacts, the rationale must be explained	See Section 7.8
d	Assessment of local air quality (Level 1/M1 proposals only)	Consideration of the impacts on local air quality, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no impact on local air quality, the rationale must be explained	N/A - environmental analysis requirements scaled equivalent to a Level 2 change, see Section 7.8
e	Assessment of impacts upon tranquillity (Level 1/M1 proposals only)	Consideration of any impact upon tranquillity, notably on Areas of Outstanding Natural Beauty or National Parks, and where appropriate the related qualitative and/or quantitative analysis If the change sponsor expects that there will be no tranquillity impacts, the rationale must be explained	N/A - environmental analysis requirements scaled equivalent to a Level 2 change, see Section 7.8
f	Operational diagrams	Any operational diagrams that have been used in the consultation to illustrate and aid understanding of environmental impacts must be provided	N/A
g	Traffic forecasts	10-year traffic forecasts, from the anticipated date of implementation, must be provided (if not already provided elsewhere in the proposal)	N/A
h	Summary of environmental impacts and conclusions	A summary of all of the environmental impacts detailed above plus the change sponsor's conclusions on those impacts	See Section 7.1

15. Annexe

15.1 References – supplied as separate documents from Ref 1 - Ref 12.

Ref No	Description	Hyperlinks
1	Seagreen Phase 1 CAA web page – progress through CAP1616	link
2	Stage 1A Assessment Meeting Presentation	link
3	Stage 1A Assessment Meeting Minutes	link
4	Stage 1B Design Principles	link
5	Stage 2A Design Options	link
6	Stage 2B Design Principle Evaluation	link
7	Stage 2B Options Appraisal (Initial) & Safety Assessment	link
8	Stage 3B Consultation Strategy	link
9	Stage 3A Full Options Appraisal	link
10	Stage 3B Consultation Document	link
11	Stage 3D Collate and Review Responses Document	link
12	Stage 4A Update Design Document	link
13	Draft AIP entries	

15.2 List of Consultation Stakeholders

Links to the consultation were placed on the NATS Customer Website and the CAA public airspace change website. The consultation was most relevant to the stakeholders listed below, but not exclusively. One member of the public responded.

Key Stakeholders: Air Navigation Service Providers

- Aberdeen Airport ATC
- NATS
- MoD (Ministry of Defence) via Defence Airspace & Air Traffic Management (DAATM)

Major Stakeholders: Aberdeen-based Offshore Helicopter Operators:

- Babcock (Bond) Helicopters
- Bristow Helicopters
- CHC Scotia Helicopters
- NHV Helicopters

Other Stakeholders:

- Members and organisations of the NATMAC (National Air Traffic Management Advisory Committee):

  AOA, AOG, AOPA, ARPAS-UK, AEF, BA, BAE Systems, BALPA, Airlines UK, BBGA, BHA, GASCO, GATCO, HCGB, Heavy Airlines, Honourable Company of Air Pilots, LAA, Light Airlines, Low Fares Airlines, PPL/ IR (Europe)

  Members of NATMAC not listed here have been engaged, and do not consider themselves stakeholders in this proposal.

- Maritime & Coastguard Agency – contracted to Bristow helicopters in this area

- Local Airfields: EGPN Dundee Airport

15.3 Draft AIP Entry

AIP section ENR 2.2

4 EN-ROUTE TRANSPONDER MANDATORY ZONES

Designation and Lateral Limits	Vertical Limits and Classification	Controlling Authority
Seagreen TMZ Phase 1 – the area bounded by: 56°28'48.316"N 1°56'21.635"W 56°28'56.706"N 1°57'42.338"W 56°29'19.903"N 1°58'49.297"W 56°29'53.266"N 1°59'35.362"W 56°30'26.418"N 1°59'55.875"W 56°31'0.251"N 1°59'59.339"W 56°40'40.162"N 1°59'51.322"W 56°41'16.339"N 1°59'40.636"W 56°41'44.708"N 1°59'15.968"W 56°42'14.164"N 1°58'26.478"W 56°42'32.981"N 1°57'22.075"W 56°42'39.062"N 1°56'13.168"W 56°42'35.348"N 1°35'42.561"W 56°42'22.592"N 1°34'28.108"W 56°41'58.290"N 1°33'26.897"W 56°41'24.944"N 1°32'12.864"W 56°40'52.426"N 1°31'26.112"W 56°32'35.237"N 1°25'54.843"W 56°31'55.589"N 1°25'41.776"W 56°31'7.564"N 1°25'58.881"W 56°30'24.930"N 1°26'53.949"W 56°30'1.552"N 1°28'4.526"W 56°29'53.254"N 1°29'38.623"W	FL 100 SFC (Class D & G)	No Controlling Authority Contact Scottish FIS (MHz 119.875) H24 from surface up to and including FL55 for flight information Flights transiting P18 when active between waypoints UPGET and OKPAL should contact Aberdeen Approach (MHz 119.055)
Note: for aircraft equipped with and operating secondary surveillance radar equipment, as defined in GEN 1-5 paragraph 5.3, access to the Seagreen TMZ Phase 1 is not subject to ATC approval. The TMZ incorporates parts of P18 (Class D) and D613C; within these areas the more stringent relevant airspace classification regulations apply.		

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