SEAGREEN OFFSHORE WIND FARM PHASE 1

CAP 1616 STAGE 1B (DESIGN PRINCIPLES) AND EVIDENCE

The purpose of this document is to demonstrate that Seagreen Wind Energy Limited (SWEL), as Change Sponsor (CS) for the Seagreen Offshore Wind Farm Phase 1 Airspace Change Proposal (ACP), has followed CAP 1616's Stage 1 (Define) and Stage 1B (Design Principles) to create a short-list of Design Principles; and provide an explanation as to how these have been influenced through the engagement process.

STATEMENT OF NEED

The following Statement of Need was submitted to the Civil Aviation Authority (CAA) on 28 March 2019:

> *"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.*
> *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.*
> *……..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."*

STAKEHOLDER ENGAGEMENT

National Air Traffic Services En-Route PLC (NERL): Prior to the 2014 planning consent, SWEL carried out detailed engagement with NERL who had indicated that Air Traffic Control (ATC) operations using the Perwinnes Primary Surveillance Radar (PSR) would be adversely affected by Seagreen Phase 1's wind turbines. At that time, it was agreed between SWEL and NERL that any adverse impact on the Perwinnes PSR would need to be mitigated; this resulted in the following planning condition being assigned to the planning consent:

Condition 23	**NERL Perwinnes: PSR Mitigation Scheme ("PRMS")**	The Company must ensure that no turbine shall be erected until a Primary Radar Mitigation Scheme ("PRMS") agreed with the Operator has been submitted to and approved in writing by the Scottish Ministers in order to mitigate the impact of the Development on the Primary Radar Installation at Perwinnes and associated air traffic management operations. No blades shall be fitted to any turbine unless and until the approved Primary Radar Mitigation Scheme has been implemented and the development shall thereafter be operated fully in accordance with such approved Scheme.

As a result, SWEL together with NATS, looked into numerous potential mitigation options following the original planning consent in 2014; this included the following:

- Extending the radar coverage of the Allanshill PSR to provide infill coverage for the Perwinnes PSR (and included live flight trials);
- Project RM - Raytheon upgrade to the Perwinnes PSR;
- Installation of a new PSR;
- Infill radar options (Terma Radar, Aveillant Holographic Radar, C-Speed Lightwave Radar);
- Radar blanking;
- Transponder Mandatory Zone (TMZ); and
- Radar blanking with an associated TMZ.

These options were considered in detail by both parties until progression of the development was held up by the Judicial Review. Once planning consent was confirmed in November 2017, SWEL re-engaged with NERL who finally confirmed that their preferred mitigation solution for Seagreen Phase 1 was radar blanking with an associated TMZ; see NERL confirmation at Annex A. Of all the mitigation options considered, TMZ was the only solution that requires an ACP to be initiated. As such, implementation of a TMZ is the only type of airspace change that needs to be considered.

Ministry of Defence (MoD): Engagement with the MoD for the 2014 consent had also identified that Seagreen Phase 1 would adversely impact on the Leuchars Station (formerly RAF Leuchars) PSR. As a result, the following planning condition was assigned to the 2014 planning consent:

Condition 20	**RAF Leuchars: ATC Radar Mitigation Scheme ("ATC Scheme")**	The Company must, prior to the erection of any WTGs on the Site, submit an Air Traffic Control Radar Mitigation Scheme ("ATC Scheme"), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with the MOD. The ATC Scheme is a scheme designed to mitigate the impact of the Development upon the operation of the Primary Surveillance Radar at RAF Leuchars ("the Radar") and the air traffic control operations of the MOD which is reliant upon the Radar. The ATC 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 ATC Scheme to be implemented prior to the operation of the turbines have been implemented and the Scottish Ministers have confirmed this in writing. The Development shall thereafter be operated fully in accordance with the approved ATC Scheme.

Recent discussion with the MoD has identified that a TMZ will also be suitable as an Interim Solution to mitigate any impact on the Leuchars PSR pending development of an enduring radar solution. It has been agreed by MoD that development of an enduring radar solution will not be achievable in time for Seagreen's planned operational date. MoD has not indicated that any other airspace-related mitigation options would be suitable; as such, implementation of a TMZ is the only type of airspace change that needs to be considered. A summary note of SWEL's meeting with MoD is attached at Annex B.

Aberdeen Airport ATC: Another key stakeholder identified is Aberdeen Airport ATC who use the Perwinnes PSR to provide ATC services to offshore helicopters operating in the north-North Sea.

Wider Engagement: In order to ensure that all potential aviation stakeholders were considered at this early stage, all NATMAC members have also been contacted by email to make them aware of this ACP. It is not expected that many NATMAC members will be affected by this ACP.

DESIGN PRINCIPLES

SWEL developed the following general Design Principles (DPs) in line with those agreed for similar ACPs developed under the CAP 1616 process; these were passed to NERL, MoD and Aberdeen Airport for comment and the following are the DPs agreed thus far:

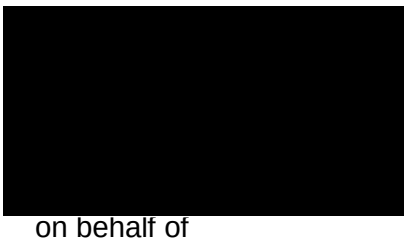
- **Safety:**
    - Airspace change should maintain or enhance current levels of safety.
    - Airspace change should be subject to the approval of a NATS safety assessment.
- **Economic:**
    - Airspace change will minimise economic impact on Aircraft Operators (AOs).
- **Environmental:**
    - Airspace change will have minimal impact on the number of track miles flown and CO2 emissions per flight.
- **Environmental (Impact to Stakeholders on the Ground):**
    - Minimise environmental impacts to stakeholders on the ground.

      (note: due to the offshore location of the proposed changes, it is not expected that there will be any significant environmental impacts to stakeholders on the ground due to noise, visual intrusion and local air quality).
    - Minimise the impact of noise below 7,000ft.
- **Operational (General):**
    - Airspace change will maintain or enhance operational resilience of the ATC network.

- **Operational (Aircraft Operators):**
    - The proposed airspace will allow AOs to flight plan as per current day operations.
- **Operational (ANSPs):**
    - Connectivity to adjacent airspace will be maintained or enhanced.
    - Airspace change should be designed to have minimal impact on Air Traffic Controllers' workload.
- **Operational (Capacity):**
    - Airspace change will have minimal impact on operations of AOs.
    - Airspace change will have minimal impact on operations of ANSPs.
- **Operational (Flexible Use Airspace):**
    - The proposed airspace change will be compatible with the Flexible Use Airspace (FUA) concept.
- **Technical (General):**
    - Airspace change should be designed to fit with existing background airspace classification.
    - The interface between the airspace change and the ATS route network will maintain or improve flight efficiency compared with current operations.
- **Technical (MoD):**
    - The airspace change will be compatible with the requirements of the MoD (if required).
- **Technical (GA):**
    - The impacts on GA and other civilian airspace users will be minimised.
- **Policy:**
    - The proposed airspace change will take account of government policy documents (such as the Air Navigation Guidance).

CAP 1616 guidance explains that it is important for the DPs to be drawn up through engagement between the CS and affected stakeholders at this early stage in the process, and that unanimous agreement on the principles may be unlikely; however, feedback from all parties (NERL, MoD and Aberdeen Airport) has been extremely positive.

A table containing the original DPs and associated comments from the relevant stakeholders is at Annex C.



on behalf of
Seagreen Wind Energy Ltd

Annexes:

A. NERL e-mail dated 30 November 2018 confirming radar blanking and TMZ as preferred mitigation solution.

B. Summary Note of meeting with MoD on 11 January 2019.

C. Design Principles and Comments from Key Stakeholders.

ANNEX A
Stage 1b NERL Confirmation E-mail

From: [redacted]@nats.co.uk>
Sent: 30 November 2018 09:47
To: [redacted]
Cc: [redacted]
Subject: Seagreen (Alpha / Bravo)

Good Morning [redacted],

Thank you for your call this morning just to confirm we have a mitigation for Seagreen (Alpha / Bravo) which is TMZ & Blanking, ……..

Kind Regards

[redacted]

NATS

[redacted]
AAU Business Support Specialist

D: [redacted]
M: [redacted]
E: [redacted]@nats.co.uk

[redacted]

ANNEX B

SUMMARY NOTE OF MEETING WITH MOD

Post Meeting Summary

Meeting	Defence Equipment and Support (DE&S), MoD Abbey Wood
Date	11 Jan 19
Attendees	Seagreen Attendees: [redacted] MoD DE&S Attendees: [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] by telecon

Introduction

[redacted]

Purpose

[redacted]

Role of DE&S Team

[redacted]

Future of Leuchars Station

[redacted]

[redacted]

Seagreen's Timelines for Development

[redacted]

Discharge of Leuchars ATC Planning Condition

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted] agreed that given Seagreen's timelines, a Phase 1 Study would be pointless as a radar solution could not be delivered before Seagreen's operational date. It was explained that NATS had requested blanking mitigation but also with a Transponder Mandatory Zone (TMZ) around the Seagreen site. DE&S agreed that it would be sensible to agree implementation of a TMZ as an Interim Solution prior to development of an Enduring Radar Solution. In order to do so, Seagreen would be required to request MoD support for a TMZ after which the MoD would be required to support the TMZ application. For condition discharge though, Seagreen would be required to enter into a Phase 2-style contract which covers TMZ as an Interim Solution and the Trial requirements for development of an Enduring Solution. This would also detail the requirement for a (Phase 1) Study to be carried out at time relevant to the commencement date of a Phase 2 Trial. This contract would be the RMSA that would enable the planning condition to be discharged. DE&S pointed out that in order to discharge the condition, it is likely that they would insist on the TMZ being approved by the CAA.

[redacted]

Annex C
Design Principles - Comments from Key Stakeholders

Serial	Design Principle	NERL Comments	MoD Comments	Aberdeen Airport Comments	Change Sponsor Comment/Final Design Principle
	Safety:		MOD content that Safety should always be listed as a DP		
1	Airspace change should maintain or enhance current levels of safety.	No comment	No comment	No comment	No change
2	Airspace change should be subject to the approval of a NATS safety assessment.	No comment	No comment	No comment	No change
	Economic:		MOD do not comment on environmental/economic impact		
3	Airspace change will minimise economic impact on Aircraft Operators (AOs).	No comment	No comment	No comment	No change
	Environmental:		MOD do not comment on environmental/economic impact		
4	Airspace change will have minimal impact on the number of track miles flown and CO2 emissions per flight.	No comment	No comment	No comment	No change
	Environmental (Impact to Stakeholders on the Ground):		MOD do not comment on environmental/economic impact		
5	Minimise environmental impacts to stakeholders on the ground *(note: due to the offshore location of the proposed changes, it is not expected that there will be any significant environmental impacts to stakeholders on the ground due*	No comment	No comment	No comment	No change

	to noise, visual intrusion and local air quality)				
6	Minimise the impact of noise below 7,000ft.	No comment	No comment		No change
	Operational (General):		MOD require that the ability for Military ATS providers to operate at the CRCs (including any Air Defence requirements), Leuchars Station and RAF(U) Swanwick is maintained		
7	Airspace change will maintain or enhance operational resilience of the ATC network.	No comment	No comment	No comment	No change
	Operational (Aircraft Operators):				
8	Create an environment within which AOs may freely flight plan optimised trajectories between defined entry and exit points.	In the lower airspace this is not appropriate, AOs will be expected to flight plan on routes. Suggest change this to: *"The proposed airspace will allow AOs to flight plan as per current day operations."*	No comment	No comment	CS Comment: Agreed Final DP: The proposed airspace will allow AOs to flight plan as per current day operations.
	Operational (ANSPs):		MOD require that the ability for Military ATS providers to operate at the CRCs (including any Air Defence requirements), Leuchars Station and RAF(U) Swanwick is maintained		
9	Connectivity to adjacent airspace will be maintained or enhanced.	No comment	No comment	No comment	No change
10	Airspace change should be designed to have minimal impact on Air Traffic Controllers' workload.	No comment	No comment	No comment	No change
	Operational (Capacity):				
11	Airspace change will have minimal impact on operations of AOs.	No comment	MOD would ask that any impact to military Aircraft Operators and	No comment	No change

			Air Defence operations, including any cumulative effect is minimised to level acceptable to the MOD		
12	Airspace change will have minimal impact on operations of ANSPs.	No comment	MOD require that the ability for Military ATS providers to operate at the CRCs (including any Air Defence requirements), Leuchars Station and RAF(U) Swanwick is maintained	No comment	No change
	Operational (Flexible Use Airspace):				
13	The proposed airspace change will be compatible with the Flexible Use Airspace (FUA) concept.	No comment	MOD are fully supportive of Flexible Use of Airspace as a concept	No comment	No change
	Technical (General):				
14	Airspace change should be designed to fit with existing background airspace classification.	No comment	No comment	No comment	No change
15	The interface between the airspace change and the ATS route network will maintain or improve flight efficiency compared with current operations.	No comment	No comment	No comment	No change
	Technical (MoD):				
16	The airspace change will be compatible with the requirements of the MoD (if required).	No comment	Due to the proximity of Leuchars Station and D613, the impact to the MOD must be considered as part of the ACP	No comment	No change
	Technical (GA):				
17	The impacts on GA and other civilian airspace users will be minimised.	No comment	No comment	No comment	No change

	Policy:				
18	The proposed airspace change will take account of government policy documents (such as the Air Navigation Guidance).	No comment	No comment	No comment	No change
	Implementation (Phasing):				
19	The proposed airspace will be suitable for a phased implementation (if required).	All of the proposed options will be single area TMZs, so none of them would be suitable for a phased implementation. Suggest that this design principle is dropped on the basis that Phasing is not now a requirement	No comment for DP phase	No comment	CS Comment: Agreed DP removed