CAA Operational Assessment

Title of airspace change proposal	Norfolk Vanguard and Norfolk Boreas Windfarms
Change sponsor	Vattenfall Wind Power Ltd
Project no.	ACP-2018-03
SARG project leader	[redacted]
Case study commencement date	8 March 2021
Case study report as at	18 June 2021

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

- yes
- no
- partially
- n/a

To aid the SARG project leader's efficient project management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved Green not resolved Amber not compliant Red

Executive Summary

Vattenfall Wind Power Ltd has planning permission to develop 2 offshore wind farms, known as Norfolk Vanguard and Norfolk Boreas Wind Farms, located approximately 47km from the Norfolk coastline to the East of Norwich. The proposed site covers an area of approximately 1300km^2 and will contain up to 180 wind turbine generators (WTGs) in each farm (up to 360 in total), ranging from 192m to 350m tall (to maximum blade tip height).

The issue of WTGs causing clutter on Primary Surveillance Radar (PSR) displays is well understood and NATS (NERL) initially objected to the proposal based on the impact it would have on the Cromer PSR. As a result, the project is subject to a planning consent condition, which is detailed in Annex 8 Para 3.4 of the Stage 3 Consultation Strategy. This condition directs that no WTGs may be erected until a PSR mitigation strategy is agreed and that prior to erection of the WTGs the agreed mitigation strategy has been implemented and in operation.

In this ACP, Vattenfall propose the application of Radar Range Azimuth Gating (RAG), more commonly known as radar blanking, to the Cromer PSR covering the area affected by the WTGs. This will prevent the display of potentially erroneous radar returns, or clutter, caused by the WTGs. In addition, a Transponder Mandatory Zone (TMZ) is proposed for implementation in the blanked area from SFC to FL100, which will allow aircraft equipped with a transponder to remain visible to ATC using Secondary Surveillance Radar (SSR) returns and non-transponder equipped aircraft to transit the area with prior clearance from the controlling authority.		
1.	**Justification for change and options analysis (operational/technical)**	**Status**
1.1	Is the explanation of the proposed change clear and understood?	**Yes**
	The Stage 4B submission document provides a clear explanation of the proposal, describes the use of radar blanking to prevent the clutter associated with WTGs affecting Air Traffic Control Officers' (ATCOs) displays and explains the need to introduce a TMZ to enable the continued provision of an Air Traffic Service (ATS) to aircraft operating in the area using SSR.	
1.2	Are the reasons for the change stated and acceptable?	**Yes**
	The reasons for the change are clearly stated in the Stage 4B submission. This document describes Vattenfall's intent to construct Norfolk Vanguard and Boreas Wind Farms and highlights that WTGs can cause false radar returns, or clutter, to appear on radar screens. Further explanation is provided to describe the potential impact of this clutter on the ability of an ATCO to provide ATS safely and effectively to aircraft operating in an area affected by the issue. The requirement to provide mitigation for the resulting loss of radar fidelity in the 'blanked' area using a TMZ is also clearly stated and acceptable. It is also clear that large numbers of WTGs could lead to saturation of the radar processing systems. The submission clearly articulates that the mitigation strategy is required to meet planning conditions imposed on windfarm developments which in turn enables construction and the realisation of the significant environmental benefits (~6MT per annum CO_2 benefits) from each of the farms generating 1.8 Giga Watts (GW) of power. The project is defined as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008.	
1.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	**Yes**
	The Stage 2A Design Options submission described several airspace and non-airspace options considered by Vattenfall to identify a solution to the anticipated impact of WTGs on the Cromer PSR. The number of viable airspace options that would satisfy the planning consent condition was limited and consisted of variations of the use of radar blanking with an associated TMZ to maintain ATS provision in the 'blanked' area. These were developed and considered, alongside the Do-Nothing option, as detailed in Stage 2 submissions.	

1.4	Is the justification for the selection of the proposed option sound and acceptable?	**Yes**
	The change sponsor considered a limited number of alternative options that could provide the mitigation required by the planning consent conditions imposed. The justification for selection of the preferred option is logical and acceptable; it also accords with similar solutions used elsewhere in the wind farm industry. However, implementation of this solution, if approved, should not impact the development of other technical solutions such as advanced radar systems. The development of innovative solutions and investment in new technology should continue and the use of TMZ's reviewed.	
2.	**Airspace description and operational arrangements**	**Status**
2.1	Is the type of proposed airspace design clearly stated and understood?	**Yes**
	The type of proposed airspace is clearly stated in the Stage 4B submission document and is well understood. Radar blanking will be implemented on the Cromer PSR to cover the area of the wind farm development. The boundary of this area will be smoothed to a regular shape and a 2nm buffer will be applied to the smoothed boundary; the resultant area will be covered by a TMZ from SFC to FL100.	
2.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	**Yes**
	The Sponsor proposes that the TMZ will be active H24, with no hours of operation or seasonal variation applied. This is considered acceptable as it accords with the wind farm H24 operation and is required in order to maintain safe operations of aircraft in the vicinity.	
2.3	Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?	**Yes**
	A small portion of the proposed TMZ (South Eastern corner) overlaps the Amsterdam Flight Information Region (FIR). Para 7.2 of the ACP states: *Amsterdam ATC have confirmed they will act as the controlling authority in the portion of the TMZ which is within airspace delegated to them. Airspace within the Dutch FIR bordering the London FIR is already designated as a TMZ and will not be affected by this change.* An email trail to evidence engagement has been provided and the Dutch are content to act as the Controlling Authority for the	

	portion that sits in their FIR. UK Air Traffic Routes L17 (base FL175), L60 (base FL175), L602 (base FL175) and L603 (base FL175) transit the windfarms locations but will not be affected by this change as the vertical extent of the TMZ will reach at and below FL100. Helicopter Main Routes (HMRs) 445, 446, 447 and 450 all transit the proposed wind farm locations. Email response from LVNL states: *A small part of this windfarm is situated in the Amsterdam FIR. For this part:* • *Our AIS department will need input from NATS for publication in our AIP.* • *We have to decide if the lower limit of the HMR concerned (KY650) has to be raised to e.g. 2000 ft or that we will resolve this in another way.* • *The part that is situated in UK Airspace will have to be published in the UK AIP.* • *Together with the operators it has to be decided if thee conflicting HMR's (445/446/447/450) have to be redirected or if the lower limit has to be raised.* Email trail has been provided to show that the sponsor has tried to clarify the points above regarding the HMRs. There hasn't been a response forthcoming but since there has been ample engagement and consultation and no further comments received from LVNL or the operators who use the HMRs it has been assumed that there are no issues. As HMRs are not routes as such, more indicators that show where there is helicopter traffic. I would agree that there are no impacts on them as a result of this ACP. ICAO High Seas Coordination Letter required. See Condition 3 within the recommendation/conditions of this assessment and Decision CAP (CAP 2190).	
2.4	Is the supporting statistical evidence relevant and acceptable?	**Yes**
	Vattenfall commissioned traffic data analysis which considered usage of the airspace affected by the proposed TMZ during a representative period in 2019 (1-14 August 2019). This analysed PSR and SSR returns through the area for the 2-week period in August, which indicated that 15 movements from a total of 9855, equating to ~0.15%, were potentially non-transponder equipped aircraft. Access for non-transponder equipped aircraft will be provided with prior clearance from the controlling authority.	
2.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	**Yes**

	At its closest point, the proposed TMZ lies approximately 47km from the nearest coastline and is therefore not expected to have any effect on local traffic patterns or operations. As a result, the complexity and workload of operations for ATCOs providing UK FIS in the region are not expected to change.	
2.6	Are any draft Letters of Agreement (LOA) and/or Memoranda of Understanding (MOU) included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?	**Partially**
	LOAs between Swanwick Mil/Amsterdam and Swanwick Mil/Anglia Radar (current versions) are provided but no new drafts with the details of this TMZ included have been supplied. However, if approved the TMZ wouldn't be implemented until Q2 2024, when construction is due to start. Therefore, as a condition of approval a condition would need to be that all LOAs are reviewed and updated prior to implementation. LOAs will need to be reviewed, updated and submitted to the CAA before implementation. See Condition 2 within the recommendation/conditions of this assessment and Decision CAP (CAP 2190).	
2.7	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 ATC Procedures can be devised, what action has the change sponsor carried out to resolve any conflicting interests?	**N/A**
	Not applicable.	
2.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	**Yes**
	Evidence provided indicates that the proposed TMZ will be implemented in line with Commission Implementing Regulation (EU) No 923/2012 of 26 September 2012 (Standardised European Rules of the Air (SERA)). The CAA Policy for Radio Mandatory Zones and Transponder Mandatory Zones dated 14th August 2015 states that "Provisions should be made for non-compliant aircraft to gain access to an RMZ or TMZ where legitimate requirement exists", and further that "A pilot wishing to operate in a TMZ without serviceable transponder equipment may be granted access subject to specific arrangements agreed with the TMZ Controlling Authority". Both these conditions have been met and access arrangements are satisfactory.	
2.9	Is the proposed airspace classification stated and justification for that classification acceptable?	**N/A**

	Not applicable. The introduction of the proposed TMZ does not seek to alter the existing airspace classification, which is stated as, and will remain, Class G.	
2.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	**Yes**
	The proposed TMZ would enable the vast majority of airspace users continued access to the airspace affected by the introduction of WTGs within the Norfolk Vanguard and Boreas Wind Farm development. However, non-transponder equipped aircraft would be prevented from accessing the airspace located within the proposed TMZ unless they obtain clearance from the controlling authority before entering.	
2.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	**Yes**
	As well as the classification and promulgation of the proposed TMZ as the primary means to provide assurance against unauthorised incursion, the design of the proposal provides additional mitigation in the form of a buffer. The area affected by the implementation of radar blanking to the Cromer PSR is smoothed to a regular shape and surrounded by a 2nm buffer to create the TMZ. PSR returns will be received from aircraft that enter the TMZ, as they cross the 2nm buffer, until they enter the area that is blanked. Vattenfall have indicated that, for a non-transponder equipped aircraft travelling at 200kts, this will ensure it remains 'visible' to an ATCO for at least 36 seconds as it transits the 2nm buffer area. Once a non-transponder equipped aircraft enters the blanked region it will no longer appear on the controller's display. It is suggested that the time it takes a non-transponder equipped aircraft to transit the 2nm buffer zone is sufficient to enable the ATCO to observe the track and to intervene.	
2.12	Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?	**Yes**
	As discussed at para 2.2, aircraft that are not equipped with a serviceable transponder will be required to remain outside the proposed TMZ; an appropriate ATS will continue to be provided to all aircraft outside the TMZ. However, non-transponder equipped aircraft will be able to enter the TMZ with prior agreement from the controlling authority.	
2.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	**Yes**
	As is currently the case, any aircraft wishing to transit the area at any time will be able to do so, without a requirement to seek	

	specific permission, provided they are equipped with a serviceable transponder. Non-transponder equipped aircraft will be able to plan their routing to achieve minimal impact and will be able to transit the notified area of the TMZ with prior approval from the controlling authority.	
2.14	Are any airspace user group's requirements not met?	**Yes**
	As described by Vattenfall, a small element of the aviation community that operates without fitment of a transponder will be affected by the implementation of the proposed TMZ. However, it is also accepted that only a very small number within that community would wish to operate in the area included within the proposed TMZ; such aircraft are more usually operated within gliding distance of the shore for safety reasons, which would locate them well away from the proposed TMZ. This appears to be confirmed by the statistical analysis of aircraft movements and by the responses received during consultation. Additionally, non-transponder equipped aircraft may be granted transit of the TMZ by prior arrangement with the controlling authority.	
2.15	Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).	**Yes**
	No change to the delegation of ATS.	
2.16	Is the airspace design of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?	**Yes**
	The airspace design proposes an area of sufficient dimension to enable blanking to remove all anticipated clutter effects on the Cromer PSR. A 2nm buffer surrounds this blanked volume of airspace to define the TMZ boundary. This 2nm buffer is required to afford ATCOs time to assimilate and act upon a potential infringement by a non-transponder equipped aircraft.	
2.17	Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter.)	**N/A**
	Not applicable.	
2.18	Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?	**Yes**

	Aircraft operating within the proposed TMZ boundary (class G airspace) and the surrounding class G airspace will be operating in accordance with applicable visual or instrument flight rules. Extant procedures for separation will remain unchanged; however, non-transponder equipped aircraft will be required to route such that they remain outside of the proposed TMZ unless they have prior clearance to enter from the controlling authority.	
2.19	Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?	**N/A**
	Not applicable. There are no terrain clearance issues of concern as the proposed TMZ is located 47km offshore.	
2.20	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?	**Yes**
	Although the proposed TMZ will be located in the vicinity of ATS routes L17, L6, L602 and L603 and HMRs 445, 446, 447 and 450 it will not affect operations within those airspace constructs.	
2.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	**Yes**
	The proposed TMZ does not impact terminal or en-route structures.	
Supporting resources and communications, navigation and surveillance	**Status (CNS) infrastructure**	
3.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	
	Communication: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure?	**N/A**
	Not applicable. No change to existing communication infrastructure is required as part of the proposed solution.	
	Navigation: Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV-derived sources, to contain the aircraft within the route to the published RNP value in accordance with	**N/A**

	ICAO/ Eurocontrol standards? For example, for navaids, has coverage assessment been made, such as a DEMETER report, and if so, is it satisfactory?	
	Not applicable.	
	Surveillance: Radar provision – have radar diagrams been provided, and do they show that the ATS route/airspace structure can be supported?	**Yes**
	The predicted impact of the installation of up to 360 WTGs to form the Norfolk Vanguard and Boreas Wind Farms drove the requirement for consideration of this ACP. The proposed implementation of Cromer PSR blanking and an associated TMZ in the area is considered the optimum solution to facilitate continued safe use of the affected airspace by the majority of aviation users.	
3.2	Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growth acceptable?	**N/A**
	Not applicable. The introduction of the proposed TMZ would not, of itself, introduce a limit to traffic growth in the area. No training or additional qualifications or resources required.	
4.	**Maps/charts/diagrams**	**Status**
4.1	Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates? (We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with aeronautical cartographical standards (see airspace change guidance), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals.)	**Yes**
	Charts and coordinates have been provided that appropriately illustrate and describe the proposed TMZ.	
4.2	Do the charts clearly indicate the proposed airspace change?	**Yes**
	The proposed TMZ is clearly indicated on the charts provided and the vertical dimensions have been clearly stated in the proposal.	

4.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft amendment?	**Partially**
	The Sponsor has provided a draft AIP amendment as part of their submission documentation. However, the implementation of the TMZ if approved, is in several years' time (Construction due to commence in 2024/25), so any AIP drafts would need to be provided and approved before implementation. See Condition 1 within the recommendation/conditions of this assessment and Decision CAP (CAP 2190).	
4.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	**Yes**
	The ADQ WGS84 spreadsheet has been submitted and approved by the CAA.	
5.	**Operational impact**	**Status**
5.1	Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory? Consideration should be given to:	
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	**Yes**
	The Sponsor's analysis indicates that the implementation of the proposed TMZ would only impact non-transponder equipped aircraft, as they will be required to remain outside of the proposed TMZ unless in receipt of a clearance to enter/transit from the controlling authority. However, the TMZ would be located approximately 47km offshore and the statistical evidence provided indicates that a negligible quantity of traffic movements (0.15%) would potentially be impacted by the proposal. This analysis is considered complete, appropriate and satisfactory.	
	b) Impact on VFR Routes.	**Yes**
	The sponsor indicates that there are HMRs that transit the area where the proposed TMZ would be. The feedback from the operators that fly those routes, indicates that they have no issues with the proposal and that the aircraft that fly the routes are all transponder equipped. An initial email from LVNL highlighting the impact on HMRs has been satisfactorily resolved despite a lack of response from the stakeholder.	

	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	**N/A**
	Not applicable. No impact on procedures and capacity.	
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	**Yes**
	Implementation of the proposed TMZ will not impact traffic using airway ATS routes L17, L6, L602 and L603 or aircraft on HMRs 445, 446, 447 and 450. There is not expected to be any impact on airfields or other specific activities within, or adjacent to, the proposed airspace: Norwich Airport responded to the ACP Consultation in support of the proposal, indicating there would be no negative impact resulting from the proposed TMZ. NATS Aberdeen (Anglia Radar) responded on behalf of Offshore Operators in support of the proposal. DAATM responded on behalf of UK ASACS and the MoD with no objection to the proposal. Two local helicopter operators (NHV and Bristow SAR) responded with either no comment or support due to the limited impact of TMZs on commercial offshore traffic.	
	e) Any flight planning restrictions and/ or route requirements.	**Yes**
	There would be no impact, restriction or change to current flight plan or route requirements for applicable operations in the area of the proposed TMZ. However, operators of non-transponder equipped aircraft will be required to plan their flight accordingly in order to avoid routing through the proposed TMZ or gain approval to enter the TMZ from the controlling authority before entering the TMZ.	
5.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	**Yes**
	The Stage 3A Consultation Document provides links to all published documentation relating to the development of the ACP and clearly states Vattenfall's intent: to develop Norfolk Vanguard and Boreas Wind Farms 1 through construction of up to 180 WTGs; to implement blanking of the Cromer PSR; and to introduce a TMZ covering the development site. The document further describes that all aircraft wishing to operate within the TMZ must be equipped with a transponder or have clearance to enter the TMZ from the controlling authority.	

Case study conclusions – to be completed by SARG project leader	Yes/No
Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?	**Yes**
The Sponsor has met with the airspace change proposal and airspace regulatory requirements described above through compliance with the CAP1616 process, as confirmed at Stages 1, 2 & 3 through the Gateway Assessment Meeting mechanism.	
RECOMMENDATIONS/CONDITIONS/PIR DATA REQUIREMENTS	
Are there any Recommendations which the change sponsor should try to address either before or after implementation (if approved)? If yes, please list them below.	**No**
GUIDANCE NOTE: *Recommendations are something that the change sponsor* ***should try*** *to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.*	
Are there any Condition(s) which the change sponsor **must fulfil** either before or after implementation (if approved)? If yes, please list them below. The planning consent granted to the Vattenfall Norfolk Vanguard and Norfolk Boreas Wind Farm developments requires a PSR mitigation strategy to be agreed prior to construction of WTGs and stipulates that the mitigation is to be implemented and in operation prior to erection of the WTGs. Vattenfall indicate that construction is due to commence in 2024/25. **Condition 1:** Prior to the implementation of the TMZ described, considered and approved within this proposal, Vattenfall must confirm the target AIRAC and provide the up to date Draft AIP amendment to the CAA for approval. The TMZ must be implemented and operational before the erection of any WTGs. It is noted that the Cromer PSR mitigation and implementation of the TMZ sought by Vattenfall is subject to several LOAs and there is a requirement for these to be updated and for a High Seas Coordination Letter to be in place. **Condition 2:** Prior to the implementation of the TMZ described, considered and approved within this proposal, Vattenfall must ensure all relevant LOAs are updated and approved by the CAA.	**Yes**

Condition 3: Prior to the implementation of the TMZ described, considered and approved within this proposal, Vattenfall must ensure that a High Seas Coordination Letter is submitted to and approved by ICAO. Failure to meet the conditions above will result in the approval for the TMZ to be withdrawn.	
GUIDANCE NOTE: Conditions are something that the change sponsor **must fulfil** either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors **must observe** any condition(s) contained within the regulatory decision; failure to do so **will usually** result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.	
Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below. **Requirement 1:** Should the proposed TMZ be approved for implementation, arrangements must be made by the Sponsor to ensure that the following data is collected for use during the PIR: • Details of occasions that requests for access to, or transit of, the TMZ by non-transponder equipped aircraft is denied. • Details of occasions a non-transponder equipped aircraft infringes the TMZ, remaining within the 2nm buffer area (PSR return remains displayed). • Details regarding the efficacy of any attempted controller intervention. • Details of occasions a non-transponder equipped aircraft infringes the TMZ and buffer, resulting in it entering the blanked area (PSR return no longer displayed to a controller). • Details regarding the efficacy of any attempted controller intervention. **Requirement 2:** Should the proposed TMZ be approved for implementation, arrangements must be made by the Sponsor to ensure that related stakeholder observations (enquiry/complaint data) are collated and presented to the CAA.	**Yes**
GUIDANCE NOTE: PIR data requirements concerns any specific data which the change sponsor **must** collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.	
General summary	

The Vattenfall Norfolk Vanguard and Boreas Wind Farm development is considered a NSIP by the UK Government's Business, Energy and Industrial Strategy department and its construction will lead to significant, strategic environmental benefit to the UK. This ACP seeks to implement an appropriate airspace solution to satisfy the conditions of the planning consent and enable the development to progress. Construction is scheduled to begin in 2024; the requirement for such an early regulatory decision is usual for ACPs associated with wind farm developments due to the timing and scale of the financial approval of these projects.

The proposed use of radar blanking on the Cromer PSR, along with the implementation of an associated TMZ, is entirely appropriate and accords with similar solutions at other wind farms in the UK. Due to the offshore location of the site and analysis that indicates the negligible amount of traffic that operates in the area without a transponder, compliance with the policy will ensure all non-transponder equipped aircraft, will require a ATC clearance to enter, is considered proportionate and acceptable.

Comments and observations

This airspace change proposal addresses the original objection from NATS(NERL) regarding the impact of the wind farm development upon the Cromer PSR and satisfies the condition attached to the planning consent. The proposed TMZ is considered the optimum size and shape to meet the safety and operational requirements of the associated PSR blanking, whilst having minimal impact on other airspace users. As with all similar TMZ associated with wind farms in the UK, if implemented, this TMZ should be periodically reviewed with respect to developments in radar technology that may provide an alternative technical solution to the impact of WTGs on PSR which could lead to the removal of this TMZ.

Operational assessment sign-off/ approvals	Name	Signature	Date
Operational assessment completed by:	AR Technical Regulator [redacted]	[redacted]	28 May 2021
Operational assessment approved by:	Manager Airspace Regulation [redacted]	[redacted]	17 June 2021

Manager Airspace Regulation comments: I agree with the comments, observations and conditions identified by the Airspace Regulation Technical Regulator within this operational report. The proposed solution of a TMZ as proposed with the identified buffers is considered acceptable mitigation to the effects of WTG on PSR. Subject to all conditions being satisfactorily met prior to implementation, I am content to recommend this Airspace Change Proposal for approval.