NORFOLK VANGUARD AND NORFOLK BOREAS WIND FARM ENGAGEMENT EVIDENCE

STAGE 1B (DESIGN PRINCIPLES) AND 2 A (OPTIONS DEVELOPMENT)

Annex E: STAKEHOLDER ENGAGEMENT EVIDENCE

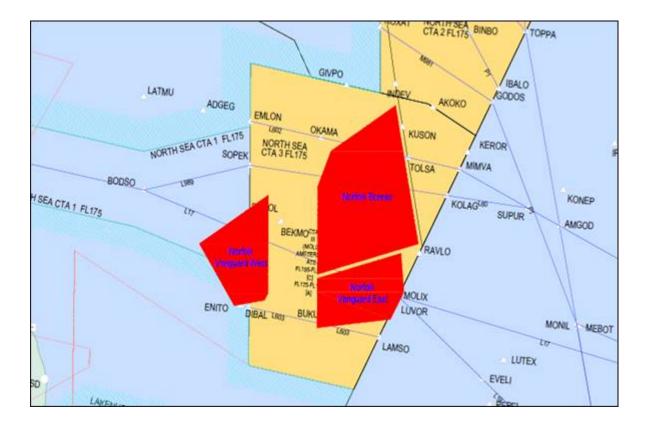
E.1 Initial engagement email 4th February 2020:

Dear Colleague,

I am writing with regards to an Airspace Change Proposal which may affect you or your organisation, which NATS are delivering on behalf of Vattenfall, following the CAP1616 Airspace Change Process.

We wish to ask you for your feedback on Design Principles (DPs) for a proposed change called 'Norfolk Vanguard & Norfolk Boreas Windfarms' (<u>link</u> to CAA web page).

Norfolk Vanguard and Norfolk Boreas Windfarms relates to the eastern portion of the UK FIR off the coast of East Anglia and partly in UK airspace delegated to the Dutch ANSP, LVNL, as shown here (yellow area is Dutch delegated airspace)



For a description of its scope, see this presentation slide pack (link).

Design Principles provide the framework for 'how should we go about designing, what is important to us, & to stakeholders'; they do not stipulate 'what sort of thing should we design'.

We provide some draft DPs below for this proposed change and ask: "is the wording right; how should they be prioritised relative to each other; what is important to you; should there be more, or fewer?"

Please can you review and give us your comments. If you have any suggestions for changes or additional design principles we welcome your input.

DP1 Safety

Maintain or enhance current levels of safety.

DP2 Operational

Minimise negative impact on other airspace users (ie GA).

DP3 Operational

Airspace change will maintain or enhance operational resilience of the ATC network.

DP4 Operational

ANSP alliance: ensure agreement between stakeholder / impacted ANSPs that the design concept being progressed suits all operations.

DP5 Operational

Airspace change will have minimal impact on operations/capacity of AO and ANSPs.

DP6 Environmental

Minimise impact on CO2 emissions

DP7 Environmental

Minimise environmental impacts to stakeholders on the ground, including the impact of noise below 7,000ft (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)

DP8 Economic

Minimise economic impact on aircraft operators.

DP9 Economic

Ensure costs and resources are proportionate to ensure appropriate safety mitigation.

DP10 Technical

Base the airspace change on the latest technology widely available.

• This technology could relate to navigation, radar enhancements, radar data processing, etc.

DP11 Technical

The volume of airspace affected should be the minimum necessary to deliver requirements, whilst providing optimal safety buffer.

• Seek to create simple, easily definable solution.

DP12 Technical (MoD):

The airspace change will be compatible with the requirements of the MoD (if required).

DP13 Policy:

The proposed airspace change will take account of government policy documents (such as the Air Navigation Guidance).

Once we have discussed DPs with all stakeholders, we will make updates to the DPs (if feedback requires it) and ask for final comments, completing two rounds of engagement with each stakeholder.

I would be grateful if you could review these draft Design Principles for the Airspace Change required for the Norfolk Vanguard and Boreas Wind Farm Developments and provide feedback by 18 February 2020

Kind regards



Airspace Change Proposal Specialist

Airspace Change Assurance







E.2 Final DP Email 15th May 2020:

Dear Colleague

We wrote to you in February with regards to an Airspace Change Proposal which may affect you or your organisation, which NATS are delivering on behalf of Vattenfall, following the CAP1616 Airspace Change Process.

We asked you for your feedback on Design Principles (DPs) for a proposed change called 'Norfolk Vanguard & Norfolk Boreas Windfarms' (<u>link</u> to CAA web page).

Thank you to those who responded and provided invaluable feedback to this process.

Please find attached the response document, which summarises all responses and proposes an amended set of Design Principles. This is in line with the "you said, we did" approach.

Please review these and if you have any additional comments please respond via email by 7 April 2020. If we do not receive a response by this time we will assume you have no further comments.

Many thanks for your time

Kind regards



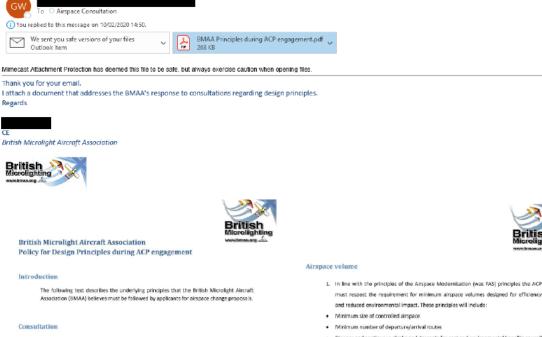
Airspace Change Proposal Specialist

Airspace Change Assurance



E.3 Email received from BMAA in response to draft Design Principles:

RE: Proposed new airspace change for windfarm development: Norfolk Vanguard & Boreas



 Steeper and continuous climbs and descents for cost and environmental benefits as well as minimisation of CAS footorint.

- 1. Sponsors must conduct and present proper analysis of overall airspace safety changes i.e. based on modelling and evidence rather than purely subjective opinior
- 2. Sponsors must provide proper validation of forecast traffic levels. There is an expectation that data used, particularly forecasts, will be verifiable including details of any and all assumptions.

Airspace integration

- 1. Sponsors must show how they are integrating their proposal within the overall UK airspace modernisation context, for example proposals which do not connect efficiently between upper and lower airspace (potentially under different airspace "management") ould only inhibit overall airspace efficiency and therefore not receive our support)
- 2. Optimisation of the development work above and below the 7,000ft NATS en-route split.

Page 1 of 2

Page 2 of 2

Regards

British Microlight Aircraft Association

Introduction

- 1. The BMAA welcomes the opportunity to engage in consultation at an early stage within the ACP CAP 1616 proces
- a. Sponsors are encouraged to engage with the BMAA and its members as early as possible during the development of the ACP. Previous ACPs have missed the opportunity for early engagement and dialogue resulting in significant and costly delays.

Airspace classification

- 1. The BMAA considers that the UK airspace's default classification is G and that sponsors must establish a safety case for proposing to change this class or add any further restrictions or requirements by their ACP.
- 2. All sponsors must demonstrate that alternatives have been considered such as RMZ and TMZ before considering controlled airspace
- 3. Where Class E is proposed, without a TMZ or RMZ should be considered as the default option.

Access by GA

- 1. Sponsors must accept the assumption that GA including sporting and recreational aviation is entitled to continued safe use of airspace and that commercial aviation does not have a right to limit airspace access.
- 2. Sponsors should ensure that there will be measures to allow flexible use of airspace and prepare for the wider use of electronic conspicuity devices and interoperability with existing e-conspicuity, e.g. FLARM and Pilot Aware etc...

27/08/19

27/05/19

Iustification

E.4 Email received from Norwich Airport in response to draft Design Principles:

RE: Proposed new airspace change for windfarm development: Norfolk Va	nguard 8	& Boreas		
		Keply All	→ Forward	•••
C To O Airspace Consultation			04/	02/2020
Vou replied to this message on 04/02/2020 16:07.				
tolly,				
Fhank you for the email and your request for feedback, please see below:				
 Norwich ATC has a contract with NATS that in the event of the Norwich PSR failing, the Cromer PSR feed objections as NATS as the Cromer PSR will experience interference from such a large wind farm. While t Service Area it may cause interference issues with the radar that could potentially affect the ability of N Norwich ATC utilise SSR data from the Cromer Radar, will the SSR maintain track of an aircraft operating 	his wind farn prwich ATC t	n is outside of th o provide a safe	e Norwich Rada	
Regards				
Air Traffic Services Manager				
Norwich Airport				
Fel:				

E.5 Email response to Norwich Airport:

Deer	
Door	

Thanks for your email.

- It is the objective of this ACP to mitigate any issues with the PSR and remove any clutter due to windfarm returns.
- Yes the SSR will maintain track; the likely mitigation is that the PSR will be blanked to remove the potential for clutter, and a TMZ will cover this area to ensure the SSR is able to maintain track of aircraft in this area.

Kind regards

E.6 Email received from NHV Norwich in response to draft Design Principles:

	S Reply	Keply All	→ Forward	
			Fri 07/02/20	20 10:39
1) You replied to this message on 10/02/2020 14:49.				
Hello				
A few points from our Norwich Chief Pilot although I'm not sure they are all airspace related:				
 Fundamentally for us, the 3 proposed wind farms are to the SE of any present operations so will reaching 1150ft AMSL, may have implications regarding icing for transit to Dutch sector. It woul circumstances. It would be my preference to have the closest point of these farms to any rig at no less than 6n is based on the assumption that we can achieve 1500ft at 6nm, clearly not the case for these fat to allow us to descend from the MSA to 1500ft by 6nm. Clearly NATS is aware of the radar clutter issues. From our point of view, if GA enters this area to will be able to pick them up. Finally, having looked at the assessment meeting NATS doc from 2018, they talk about the use removing if not already done so, as they are not used by us. 	ld be useful to hav m, to allow for us rms so the distand without a seconda	e a corridor runi to carry out ARA ce should be exte ry capability, the	ning E-W under s 's when needed. ended proportion en neither us or A	such I. This nally ATS
Kind regards,				
UK Flights Operations Manager				
NHV Helicopters Ltd				

Re: Proposed new airspace change for windfarm development: Norfolk Vanguard & Boreas

E.7 Email response to NHV Norwich:



Thanks for sending this on, I will ensure this is captured within the relevant section of the ACP process

Kind regards

E.8 Email received from Humberside Airport in response to draft Design Principles:

Dear

Thank you for your email.

Comments/questions from the 'presentation slide pack':

1. **Slide 1.** Can you confirm that it has taken since 4th October 2018 (believed to be the date of the 'Stage 1 Assessment Meeting' from Slide 1 of the presentation slide pack) to get to this stage for what is a relatively simple request? If so, help!!

2. **Slide 7.** I note the red curved line showing further to the east. Why is there no red showing within the Norfolk Vanguard West as this is closer to the Cromer Radar?

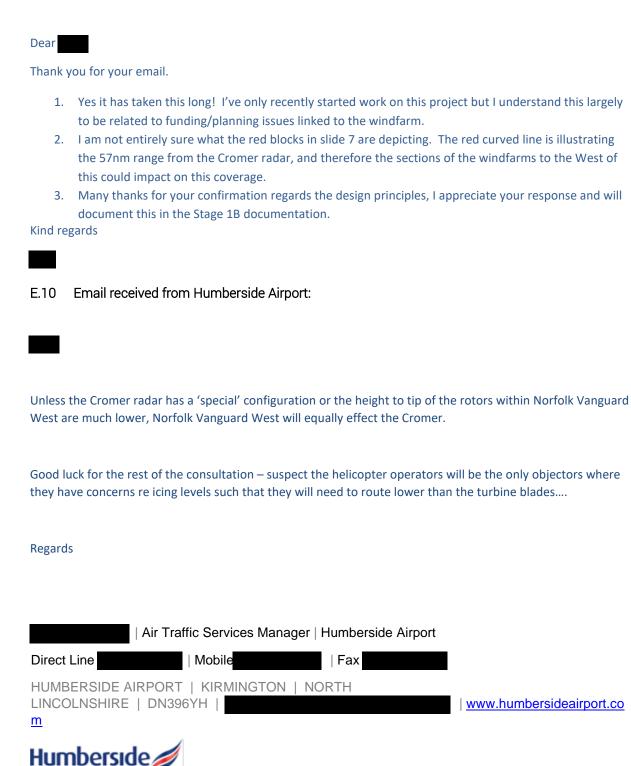
Lastly, I am content with the design principals as described in the email.

Regards

Air Tra	ffic Services Mana	ager Humberside Airport	:
Direct Line	Mobile	Fax	
HUMBERSIDE AIRPORT LINCOLNSHIRE DN39 <u>m</u>		NORTH	<u>www.humbersideairport.co</u>
Humberside			

All visitors to Humberside International Airport should proceed to the airport Information Desk on arrival, to book in and receive a visitors pass. If your visit requires you to visit airside areas, please consult your visit sponsor regarding ID requirements.

E.9 Email response to Humberside Airport:



All visitors to Humberside International Airport should proceed to the airport Information Desk on arrival, to book in and receive a visitors pass. If your visit requires you to visit airside areas, please consult your visit sponsor regarding ID requirements.

E.11 Email received from Aberdeen ATC in response to draft Design Principles:

Hi — comments from Aberdeen (who carry out the offshore helicopter operation in this area – 'Anglia Radar') in red below.

Slight correction to the airspace description below, you mention that some of the airspace in this area is delegated to LVNL (yellow shaded area), this is not entirely correct. The LVNL delegated area does not go all the way to sea level. Anglia Radar provides UKFIS in the yellow shaded area from sea level to FL65 managing the offshore helicopter operation.

Kind Regards





D:	
M:	
E:	

Control Tower Building Aberdeen, AB21 7DU www.nats.co.uk



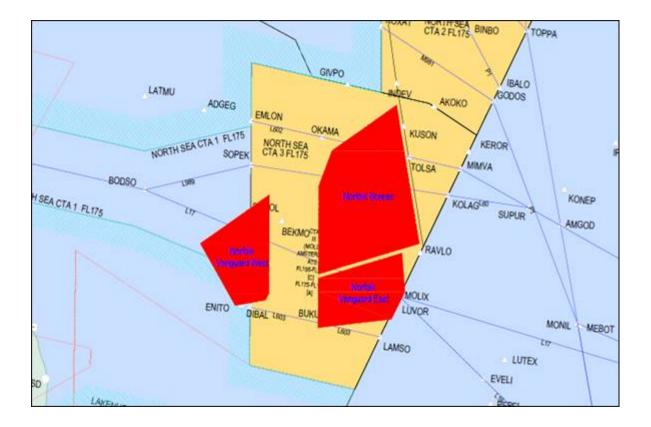
From: Airspace Consultation
Sent: 04 February 2020 13:37
To: Airspace Consultation <a irspaceconsultation@nats.co.uk
Subject: Proposed new airspace change for windfarm development: Norfolk Vanguard & Boreas

Dear Colleague,

I am writing with regards to an Airspace Change Proposal which may affect you or your organisation, which NATS are delivering on behalf of Vattenfall, following the CAP1616 Airspace Change Process.

We wish to ask you for your feedback on Design Principles (DPs) for a proposed change called 'Norfolk Vanguard & Norfolk Boreas Windfarms' (link to CAA web page).

Norfolk Vanguard and Norfolk Boreas Windfarms relates to the eastern portion of the UK FIR off the coast of East Anglia and partly in UK airspace delegated to the Dutch ANSP, LVNL, as shown here (yellow area is Dutch delegated airspace)



For a description of its scope, see this presentation slide pack (link).

Design Principles provide the framework for 'how should we go about designing, what is important to us, & to stakeholders'; they do not stipulate 'what sort of thing should we design'.

We provide some draft DPs below for this proposed change and ask: "is the wording right; how should they be prioritised relative to each other; what is important to you; should there be more, or fewer?"

Please can you review and give us your comments. If you have any suggestions for changes or additional design principles we welcome your input.

DP1 Safety

Maintain or enhance current levels of safety.

DP2 Operational

Minimise negative impact on other airspace users (ie GA). Also helicopters in support of UK Oil, Gas and Renewables industries.

DP3 Operational

Airspace change will maintain or enhance operational resilience of the ATC network.

DP4 Operational

ANSP alliance: ensure agreement between stakeholder / impacted ANSPs that the design concept being progressed suits all operations.

DP5 Operational

Airspace change will have minimal impact on operations/capacity of AO and ANSPs. Note – the development could impact on minimum safe altitudes (MSA) used by helicopters in this area.

DP6 Environmental

Minimise impact on CO2 emissions

DP7 Environmental

Minimise environmental impacts to stakeholders on the ground, including the impact of noise below 7,000ft (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) Note – if the proposal affects the routings (lateral or vertical) of low level helicopter operations, the environmental aspects (increased fuel burn/ greater CO2 emissions) need to be captured

DP8 Economic

Minimise economic impact on aircraft operators.

DP9 Economic

Ensure costs and resources are proportionate to ensure appropriate safety mitigation.

DP10 Technical

Base the airspace change on the latest technology widely available.

• This technology could relate to navigation, radar enhancements, radar data processing, etc. might want to change the word 'radar' to 'surveillance' as this would give you more options (e.g. WAM and ADS-B mitigations)

DP11 Technical

The volume of airspace affected should be the minimum necessary to deliver requirements, whilst providing optimal safety buffer.

• Seek to create simple, easily definable solution.

DP12 Technical (MoD):

The airspace change will be compatible with the requirements of the MoD (if required).

Can we have another technical?

DP12½ Offshore Helicopter Operation

The airspace change will be compatible with the requirements of the offshore helicopter operation supporting the UK Oil, Gas and Renewables industries.

DP13 Policy:

The proposed airspace change will take account of government policy documents (such as the Air Navigation Guidance).

Once we have discussed DPs with all stakeholders, we will make updates to the DPs (if feedback requires it) and ask for final comments, completing two rounds of engagement with each stakeholder.

I would be grateful if you could review these draft Design Principles for the Airspace Change required for the Norfolk Vanguard and Boreas Wind Farm Developments and provide feedback by 18 February 2020

Kind regards

E.12 Email received from NATS (NERL) in response to draft Design Principles:

Dear

NATS thank you for the opportunity to provide feedback on these draft design principles. Largely, we are in support that they would be appropriate for the proposed airspace change. Specific feedback is in relation to:

DP4 Operational

ANSP alliance: ensure agreement between stakeholder / impacted ANSPs that the design concept being progressed suits all operations.

Consider rewording this to (amendments in bold)

ANSP **alignment:** ensure agreement between stakeholder/impacted ANSPs that the design concept being progressed suits all operations **to mitigate the impact on surveillance systems**

Rationale - this wording is a more accurate representation of the co-ordination involved in engaging and consulting with ANSPs and ensuring agreement for the potential impact, specifically on their radar systems in order to keep this relevant and measurable.

Best regards



Manager, Airspace Change Compliance & Delivery

☎: | ⊠:

Directorate of Airspace & Future Operations

E.13 Response received from LVNL

Dear Sir/Madame,

Thank you for informing us about windfarm Norfolk Vanguard East. Our observations:

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 the conflicting HMR's (445/446/447/450) have to be redirected or if the lower limit has to be raised.

What is the planning. When will this windfarm be build?

Best regards,



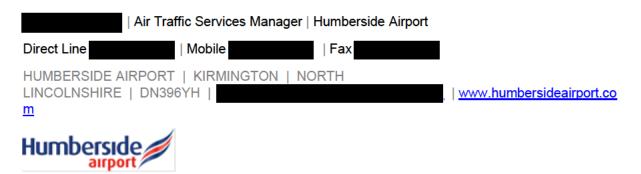
| Business Support | Procedures Department

E.14 Final Response received from Humberside Airport



We have no further response other than to request updated radar impact diagrams based on the whole area (no hurry for these as slow time I'm looking to assess the likely impact of these larger turbines).

Regards



All visitors to Humberside International Airport should proceed to the airport Information Desk on arrival, to book in and receive a visitors pass. If your visit requires you to visit airside areas, please consult your visit sponsor regarding ID requirements.

E.15 Response received from NATS (NERL)

Dear

NATS (NERL) have no further comments.

Best regards



Manager, Airspace Change Compliance & Delivery

2:

E.16 Draft Design Options for Engagement

Dear Colleague,

Airspace Change off the Norfolk Coast

NATS on behalf of Vattenfall Wind Power are progressing an Airspace Change Proposal to mitigate against radar interference anticipated as a result of the Norfolk Vanguard and Norfolk Boreas windfarms on the Cromer primary surveillance radar.

We are currently at Stage 2 of the CAP1616 Airspace Change process. This stage involves preparing and evaluating Design Options for this change. Please find attached a copy of our Stage 2A(i)- Design Options document. This document provides 1 proposal for the PRMS with 5 options as to how this could be implemented.

At this stage of the Airspace Change Process we are required to provide evidence that design options have been developed and influenced by stakeholder feedback. As such, we would like to invite your feedback on these options by 20th July 2020.

At the next stage of the process, you will be formally consulted on the best design option(s)

Kind regards

NATS Airspace Change Team



E.17 Draft Design Options for Engagement follow up

Dear Colleague,

Airspace Change Off the Norfolk Coast

NATS on behalf of Vattenfall Wind Power contacted you on 7th July requesting feedback on our design options to mitigate against radar interference anticipated as a result of the Norfolk Vanguard and Norfolk Boreas windfarms on the Cromer primary surveillance radar.

Thank you if you have already responded. We understand that not everyone is going to be able to respond, however if you are able we would appreciate your feedback by the 20th July 2020.

Kind regards

NATS Airspace Change Team



E.18 Draft Design Options response received from BGA

Thanks for asking.

This airspace change is a long way offshore and in an area where gliding does not/cannot take place. We have no comments on the design options.

Kind regards

BGA

E.19 Draft Design Options response received from Aberdeen ATC

Thank-you for the consultation regarding mitigation options for the Norfolk Vanguard and Norfolk Boreas wind farm developments.

In respect of the Anglia Radar operation we would be content with the blanking of Cromer primary radar with an associated TMZ as a suitable mitigation. You offer 4 solutions, all of which would work; our preference would be for Option D (simple shape with a buffer to give some warning of an infringement), followed by Options C, B and A in that order.

There will be a number of blanking/TMZ areas in the offshore airspace covered by Anglia Radar, with a likelihood of more in the near future (Hornsea 1-4 developments) and we would ask you to consider if this is an appropriate time to look at creating a large blanking/TMZ area covering the whole of this airspace, which would be simpler and better for the operation, reduce the possibility of mistakes and be beneficial to the wind farm developers.

Best wishes



Aberdeen AB21 7DU

E.20 Draft Design Options response received from NERL

Thank you for giving NATS the opportunity to respond to this ACP.

NATS support the proposal in order to ensure that the potential impact of wind turbines on ATC Radar systems is mitigated.

Regards



Manager NATS Operational Policy

M:	
E:	

E.21 Draft Design Options response received from NHV Helicopters

We have no objections to the ACPs.

Kind regards,









E.22 Draft Design Options response received from DAATM Good afternoon,

Thank you for the engagement material and opportunity to provide feedback to this proposal.

MOD do not have any concerns to any of the options proposed at Stage 2 of this ACP, subject to the mitigation being approved, implemented and operational before erection of the wind turbine generators as per the Condition of the development agreement. Option D would be the MoD preferred option due to the benefits of the 2nm buffer and the simplified shape for the simplicity of display purposes to aircrew and controllers.

Please let me know if you require further,

Thanks

 | SO2 Airspace Plans | Defence Airspace and Air Traffic Management |

 CAA Aviation House | Gatwick, RH6 0YR | Civilian Telephone:
 | E-Mail:

.23 Draft Design Options for Engagement follow up email to LVNL

Dear

Thank you for your engagement on the stage 1B design principles for this Airspace change. As per the UK CAA CAP1616 process we are also required to engage with stakeholders on the design options which are developed prior to the formal engagement in Stage 3.

I contacted you in July with a list of draft design options, document attached, and was wandering if you had any further feedback on any of the design options prior to formal consultation?

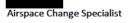
A brief description of the design options are:

- 1. Option A: RAG Blanking and TMZ over the proposed windfarm locations.
- 2. Option B: RAG Blanking over the proposed windfarm locations. TMZ extended to include a 2 NM buffer.
- 3. Option C: RAG Blanking over the proposed windfarm locations. Simplified polygon TMZ "rubber banded" around proposed windfarm locations with no buffer.
- 4. Option D: RAG Blanking over the proposed windfarm locations. Simplified polygon TMZ "rubber banded" around proposed windfarm locations extended to include a 2 NM buffer.

Should you have any further questions please feel free to ask.

Kind regards







E.24 Draft Design Options for Engagement follow up email to LVNL

Dear ,

Apologies if this is a duplication. We have previously been in contact with Alma Kampman in regards to this change. We received the following feed back in relation to the CAP1616 stage 1B design principles:

"Thank you for informing us about windfarm Norfolk Vanguard East. Our observations:

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 the conflicting HMR's (445/446/447/450) have to be redirected or if the lower limit has to be raised.

What is the planning. When will this windfarm be build?"

As per the UK CAA CAP1616 process we are also required to engage with stakeholders on the design options which are developed prior to the formal consultation in Stage 3.

I contacted **in** July with a list of draft design options, document attached, and had not received any further feedback. I was wandering if you would be able to provide any further feedback on any of the design options prior to formal consultation?

A brief description of the design options are:

- 1. Option A: RAG Blanking and TMZ over the proposed windfarm locations.
- 2. Option B: RAG Blanking over the proposed windfarm locations. TMZ extended to include a 2 NM buffer.
- 3. Option C: RAG Blanking over the proposed windfarm locations. Simplified polygon TMZ "rubber banded" around proposed windfarm locations with no buffer.
- 4. Option D: RAG Blanking over the proposed windfarm locations. Simplified polygon TMZ "rubber banded" around proposed windfarm locations extended to include a 2 NM buffer.

Should you have any further questions please feel free to ask.

Kind regards

E.25 Draft Design Options Response Received from LVNL

Dear

We had a look into the draft desing options and option C and D are our preferred options.

The 2NM buffer is of no real importance for Amsterdam FIC.

Best regards,



| Busienss Support | Procedures Department