

MOD/3/3
“REFERENCES” DOCUMENT: A

From: eliasr505@hqlcr.mod.uk [mailto:eliasr505@hqlcr.mod.uk]
Sent: 21 November 2007 16:06
To: IMCEAX400-
c=GB+3Ba=+20+3Bp=MOD+3Bo=DII+3Bs=Sinclair+3Bg=Andrew+3Bi=AD+3B@hqlcr.mod.uk
Cc: IMCEAX400-_ou2=station_ou1=waddington_cn=wadairc2isroeu-occ2sptoies_o=raf_p=mod_a=+20_c=GB_@hqlcr.mod.uk; AOS-HLWID3 (Lorimer, Robert); AOS-HLWID2b (Spencer, Mark); smithj757@hqlcr.mod.uk; rimmern529@hqlcr.mod.uk; reedk985@hqlcr.mod.uk; IMCEAX400-_s=STC-ATCTERM3SO2_o=DII_p=MOD_a=+20_c=GB_@hqlcr.mod.uk; colin.deane602@mod.uk; IMCEAX400-_s=STC-ACCATCPROGST3SO2_o=DII_p=MOD_a=+20_c=GB_@hqlcr.mod.uk; IMCEAX400-c=GB+3Ba=+20+3Bp=MOD+3Bo=DII+3Bs=Slocombe+3Bg=Nicholas+3Bi=NR+3B@hqlcr.mod.uk; IMCEAX400-_s=STC-ACCATCPROGST2SO2_o=DII_p=MOD_a=+20_c=GB_@hqlcr.mod.uk
Subject: Release-authorized: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U
Importance: High

Sir,

I have sought the advice/assistance of our Radars Engineering Authority and Technical Branch (TB) experts, who have confirmed that the TB will provide technical support to Defence estates on the likely effects the proposed windfarms may have on ATC radar systems at RAF Spadeadam and write the report for the Proof of Evidence within the requisite timescales under their existing ADATS Consultancy Task (Work Request 50177).

As far as the 'provision of a suitably qualified technical/scientific witness' is concerned, Mr Mark Spencer, our TB Radar expert at Henlow, will be available to appear at the public inquiry. The completed proof of evidence will be sent to Sqn Ldr Deane and Mr Julian Chafer.

I stand ready to assist should you have any further questions; I intend to direct future correspondence to Sqn Ldr Deane unless directed otherwise.

Thanks

Rob

R A Elias
Flt Lt
ADATS DRM/FCM
95331 Ext 6546
01480 52151 Ext 6546

-----Original Message-----

From: Sinclair, Andrew Wg Cdr
Sent: 20 November 2007 16:19
To: DES-adats-drm1-fltchk
Subject: Release-authorized: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U

Rob,

Tried to call, no joy. The message below and Colin Deane are the only contacts that I have had with this issue. Happy to discuss though if you have any questions. C4I have an expert contact in the field of radar; he is a contractor so would cost money!! His name is Alan Collinson of CSL, he is contactable at alancollinson@compuserve.com. We have not approached him about this but you may wish to use him. Good luck.
Cheers

Andy
A D SINCLAIR
Wg Cdr
SO1 ATC (Area)
01494 495703
Mil: 95221 5703
andrew.sinclair141@mod.uk

With effect from 30 Nov 07 my new role name (for DII users) will be Air BM-ATC Area SO1 and my extension number will be 4142.

From: DES-adats-drm1-fltchk
Sent: 20 November 2007 14:55
To: Sinclair, Andrew Wg Cdr
Subject: Release-authorized: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U

Sir,

Looking into it now, I will call once I have identified a way forward.

Thanks

Rob

R A Elias
Flt Lt
ADATS DRM/FCM
95331 Ext 6546
01480 52151 Ext 6546

-----Original Message-----

From: Sinclair, Andrew Wg Cdr
Sent: 20 November 2007 12:52
To: DES-adats-drm1-fltchk
Subject: Release-authorized: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U
Importance: High

Rob,

Joe has requested that I forward this to you for action. Hope all is well.

Sinkers

A D SINCLAIR

Wg Cdr

SO1 ATC (Area)

01494 495703

Mil: 95221 5703

andrew.sinclair141@mod.uk

With effect from 30 Nov 07 my new role name (for DII users) will be Air BM-ATC Area SO1 and my extension number will be 4142.

From: Sinclair, Andrew Wg Cdr
Sent: 20 November 2007 09:34
To: DES-adats-cos
Cc: Barber, Debs Gp Capt ; Slocombe, Nicholas Lt Cdr ; Sharp, Paul Wg Cdr ; Ingamells, Sandra Sqn Ldr ; Deane, Colin Sqn Ldr
Subject: Release-authorized: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U
Importance: High

Joe,

Tried to call but no joy. As per my message I am forwarding this on behalf of Gp Capts ATC & ACC. The request below (highlighted in red), from Julian Chaffer, falls outside our sphere of expertise here at HQ AIR but appears to fall within the realms of your team. I would be grateful if you could take this up directly with Julian as per his request. Happy to discuss if required.

Cheers

Andy

A D SINCLAIR

Wg Cdr

SO1 ATC (Area)

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Mil: 95221 5703

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With effect from 30 Nov 07 my new role name (for DII users) will be Air BM-ATC Area SO1 and my extension number will be 4142.

From: DE Ops North-LMS7 (Chafer Julian Mr) On Behalf Of DE Ops North-LMS7 (Chafer Julian Mr)
Sent: 19 November 2007 18:25
To: STC-ATC GP CAPT; STC-ACC GP CAPT
Cc: Deane, Colin Sqn Ldr; Colin Andress
Subject: 20071119-Steadings/Green Rig/Ray wind farm public inquiry-U
Importance: High

Deb / Christina,

I am sending this e-mail to ask for your support in identifying and securing the services of, a suitable technical expert witness for the forthcoming public inquiry into the proposed wind farms known as Steadings, Ray, and Green Rig (all in Northumberland near Spadeadam).

Colin Deane and I were with Counsel and TSol today to talk about preparations for the inquiry which is due to start in Newcastle on 15 Jan 08. While Colin is more than happy to be an expert witness and speak about the operational consequences for ATC radar operators who have to deal with the interference caused by wind turbines he is, understandably, less comfortable which the prospect of answering questions about the what/where/why/how of the technical and scientific aspects of the structure, findings, and recommendations of our radar trials.

It was Counsel's opinion that, given the complexities of the inquiry (three wind farms affecting three radars (Berry Hill and Deadwater at Spadeadam and the NATS en-route radar at Great Dun Fell) and the assertive/aggressive stance of at least two of the developers) **it would be in MOD's best interest to provide a suitably qualified technical/scientific witness**. I presume that either the OEU at Waddington or the ADATS IPT could provide someone. We will need the lucky volunteer to produce a comprehensive written Proof of Evidence (help will be provided!) and also appear at the inquiry (the days to be set aside for aviation issues have yet to be agreed).

The current deadline for the Proof of Evidence is 03 Dec. However, two of the developers have asked for the inquiry to be postponed (so they can have more time to try to persuade the MOD and the other aviation objectors (Newcastle Airport and NATS) to lift their objections)...a decision on this is hoped for within days. Even if the postponement is not allowed we have suggested that a second pre-inquiry meeting is held on 14 Dec to make sure the inspector is clear about where the respective parties are regarding aviation issues. If that meeting goes ahead (it would most probably be held in Newcastle or somewhere nearby) it is likely that the deadline for Proofs would be put back until at least 15 Dec.

I would be most grateful for all the help you can give.

If you have any questions please do not hesitate to let me know.

Looking forward to our meeting on 26 Nov.

Kind regards

Julian

Julian Chafer FRICS

**Head of Safeguarding
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Safeguarding solutions to Defence needs



MINUTES OF RADAR SUB GROUP

Date: 28th March 2007
Time: 10.30 – 14.30
Venue: DTI, London

Present:

Zoë Keeton	DTI	Julian Chafer	DE
Mark Dorrington	AEA Energy & Environment	Alistair Abington	CAA
Duncan Ayling	AEA Energy & Environment	Colin Caldwell	Scottish Power
Sqn Ldr Matt Wood	RAF, AD Radar	Chris Tomlinson	BWEA
Jason Strong	NERL	Simon Holt	RWE npower Renewables
Alasdair Auld	NERL	Tim French	RES Ltd.
		Guy Wilson	Energiekontor

Apologies:

Jonathan perks	AEA Energy & Environment	Rachel Ruffle	RES Ltd.
Neil Durrant	DE		
Colin Cragg	BAA/AOA		
Jonathan Cashmore	MOD, AD and ATC		
Alastair Clarke	NSL		

1) INTRODUCTION AND WELCOME

Zoë Keeton opened the meeting by welcoming all those present. Zoë briefly updated the RSG on the current position regards to meeting the government's ambitious targets for renewable energies and how the issues/topics discussed by the RSG would therefore be of ever more increasing importance.

2) MINUTES OF LAST MEETING

Mark Dorrington asked the group for comments on the minutes of the last meeting.

Simon Holt asked for clarification regarding the 'final notification letter' mentioned in section 5b of the minutes 13.12.06.

Julian Chafer answered that it was to help clear 'dead wood': This letter would inform developers that after 2 years, any MOD approval from a pre-planning consultation is invalidated. Also, at the formal planning stage if a project alters either from a change in turbine location of more than 50metres or an increase of turbine tip height, then this will require re-consultation. Chris Tomlinson asked JC to highlight this in the letter to developers. JC added that DE have not yet issued this final letter.

Chris Tomlinson suggested that DE write to developers one last time to explain the process and that the letter is copied to CPO's.

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JC added that the MOD currently rely on LPA's to send information on applications, as the MOD is not yet a statutory consultee.

Colin Caldwell suggested that the MOD put any specific conditions into the consents for specific developments. JC replied that the MOD are attempting to do this.

3) ACTIONS FROM LAST MEETING

- I) Fiona Livingston will announce further workshop dates as they become available
- II) NATS/Raytheon report circulated via BWEA and DTI website
- III) Zoë to liaise with DTI/DfT in seeking continued support for the NATS/Raytheon programme - DTI is working on a central lobbying position regarding overall carbon targets and the impact of aviation on meeting them. Zoë is arranging a high level meeting between DfT, DTI and CAA to establish what needs to happen to take this forward, including fund from Treasury. Jason Strong is keen to get a high level NATS Board member to this meeting.
- IV) Zoë to contact DfT and seek advice as to whether airports should be contributing towards employment of mitigating technologies. To be discussed
- V) BAE Systems and QiniteQ to give presentation at this meeting
- VI) Stealth presentations superseded by presentations by BAE and QiniteQ
- VII) Colin Caldwell sent note containing performance specifications and questionnaire
- VIII) Jason to email DE highlighting NATS objections in the Greater Wash area. To be discussed
- IX) Copy of BAE Systems Clatter 1 report provided 14 March 2007, will be sited on DTI website very soon after formatting **Action: Mark to forward to Chris as soon as report is ready for publication**
- X) Meeting held with HVR regarding Safety Cases on 2 Feb 07. Mark commented the report fell short of stakeholders' hopes. The final report has been delayed whilst we try to obtain further information from manufacturers and MoD. It is anticipated that the report will made available in the next 2 months.
- XI) Phase 1 NATS/Raytheon report is on the DTI website
- XII) NATS/Raytheon presentation with BWEA members held in February
- XIII) Planning Strategy Sub-group feedback. To be discussed
- XIV) Rachel Ruffle and Jonathan Cashmore to further refine the Assessment Methodology – Tim French, (RES) explained the radar parameters were not available from the MOD. Correspondence between MOD and RES suggested QinetiQ may be able to do a pre plan with MOD but there are confidentiality issues. Julian explained that military radar capabilities are secret but that new radars will be commercial. European task force to develop a European methodology. QinetiQ have been commissioned to undertake the methodology. **Action: Jason to liaise with Eurocontrol in attempt to acquire further information for the Assessment Methodology**
- XV) Colin provided information on micro –turbines sites
- XVI) MOD have commissioned QinetiQ to look at micro turbines and identify their RCS

XVII) DEFRA has concerns over aviation radar and micro/small wind turbines. DCLG are working with CAA and MOD to resolve these issues. Wind industry would like to see an example where micro turbines have shown up on radar. The aviation community may want to see a small exclusion zone around radar because the relatively low RCS should mean only an issue within close proximity to radar. **Action: Colin to contact Energy Saving Trust (EST) for the report and coordinates of micro turbines and forward to Jason and Julian for them to assess.**

XVIII) Zoë has provided the link for the DCLG micro generation consultation: <http://www.communities.gov.uk/index.asp?id=1508888>

4) MITIGATION SOLUTIONS

a. Stealthy blade projects

Progress to be covered in presentations (Item 8)

b. Matt Wood explained the ADR upgrades

MOD went to contract on 18th December for 2 x T102 radars. First will be installed in November at Brizlee Wood and second mid 2008 at Trimmingham (not Staxton Wold). The change in priority is due to manpower – MOD have to find a way to man the third radar which is replacing the east coast T93 therefore deploy people from Lincs to Staxton Wold is easier and cheaper.

Ongoing update of the 6 ADRs is in progress but not fixed. Staxton Wold is currently funded until 2012 and will soon have 101 radar which has no turbine mitigation.

The MOD are carrying out a study of base locations and strategy in July which will influence locations of equipment.

Still on target for delivery dates and the first should be operational by January 08.

Wind turbine testing – have taken up a number of features that were identified in the trials (decoupling the higher and lower beams / automated digital tracking / finer clutter maps). Will likely not be 100% solution but will conduct flight trials. Flight trials are still very much a ‘work in progress’. No time frame is available for these trials.

Reducing radar cross sections of turbines will also help.

The Chief of Defence staff says MOD is not allowed to accept ANY degradation in relation to anti terrorist work in the UK.

c. In fill radar back up solution

Chris said that BWEA members need to know the scope of the QinetiQ study. MOD maintain that they need the radar selected to decouple upper and lower beams but they still have side lobes which point downwards.

Mark and Zoë commented that once the QinetiQ report released MOD will make decision on whether infill radar is an acceptable option. MOD will prioritise decision once report received. Only then can we consider if further testing is needed.

Action: Mark to release as much information as possible on the QinetiQ study to BWEA for Chris to send to Greater Wash developers.

Jason commented that in fill does not help NERL.

d. Clatter Trials

MOD feel that both mitigating technologies (BAE Systems and Sensis) are worthy of further development. OEU's assessment on each technology has been sent to each of the manufacturers. The manufacturers are in the process of replying. Further flight trials would be required but first, BAE and Sensis need to take on board MOD feedback and make changes.

It was noted that NATS are very interested in the SP3000.

Action: Chris to invite Sensis over for presentation, provide date for RSG and ask for a pre meeting with aviation community.

e. NATS / Raytheon Study

Zoë explained that following the completion of phase 1 a meeting to discuss the way forward was held with NATS and Raytheon. Future work programmes and timescales were discussed. CT commented that developers have concerns over the timescales suggested. Zoë added that she sent CT a letter detailing the Raytheon study and way forward. CT will proof read and forward to his members.

There was a consensus of opinion that US will saturate demand regardless of whether UK funds development. US are doing massive scale radar replacement programme on the hardware processing side.

Action: Chris to circulate note to BWEA members, summarising developers concerns for their comments

Action: Chris to gather views of BWEA members and forward to NATS. Zoë will then invite Raytheon to attend a meeting.

Action: Jason to talk to Raytheon regarding coming to UK in May.

5) PLANNING ISSUES

Zoe briefly explained the Terms of Reference for the recently established 'Aviation Planning Strategy Group'. Zoë mentioned that the group have been working on:

- a. Adapting an existing web based interactive map to assist with planning issues related to aviation and wind energy development
- b. Producing a 5 page Planning Guidance document aimed at Planning Authorities, developers and other interested parties. This will be circulated in May. **Action: Duncan to request feedback on draft document from PSG and circulate document in May.**

6) AOB - None

7) Date of next meeting – last two weeks in June 2007.

Action: Mark to organise next meeting

8) PRESENTATIONS

Matt Bryanton, Project Manager BAE – Stealth Project

Cost – 10% increase of overall turbine

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Minimise O&M costs – 20 year design life
 Minimise design alterations and maintain existing manufacturing methods
 20dB reduction in RCS required

Tower – Cause of 75% of RCS. Easy to get reflection loss of -20dB for tower – easy to change shaping (conical is better) and design RAM into the tower. RAM is 20mm thick and lightweight. Completed vibration testing.

Nacelle – Cause of 4% of RCS. Can be shaped and RAM 12mm thick providing composite housing. Target was -15dB which has been reached for low frequency but not yet for high frequency.

Blades – Cause of 20% of RCS. Harder for the blades given the materials required for blade structure and restrictions in changing shaping. Cost of RAM for blades is also much higher for blades. Consider separately the leading edge, trailing edge and the mid section – all of which contribute equally to the RCS.

- Leading edge – 13mm RAM
- Trailing edge – 20mm RAM but cannot go to tip as no space left
- Mid section – 6mm RAM – most difficult section
- Blade tip – cannot treat this section but contribution to RCS is very small.

Next steps:

Manufacture and test all the components except the tower (just to parts). Predict wt RCS enhancement

Final report due end 2007.

RCS Reduction the only solution to marine.

Concern from Colin that BAE are not addressing 1.3Ghz and 3Ghz.

Steve Appleton – QiniteQ

Stage 1 - Information collection – complete

Can put a CAD through the SPECTRE model to examine RSC from various radar locations, while changing the location, orientation of the turbine and blades.

Stage 2 –RAM treatment scheme – complete

Have reduced RCS successfully. Tests carried out North of Blythe for probability of detecting/loosing targets found that RAM blade and conical tower could reduce false plots by ration of 8:1

Stage 3 – Turbine RAM development and testing (including blade composites, tower cladding and nacelle cover – underway

Stage 4 – Install

Stage 5 – Assess

Planned completion date in 9 months.

SUMMARY OF ACTIONS

Action number	Action
1	Action: Mark to forward Clatter 1 report to Chris, as soon as report is ready for publication

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2	Action: Jason to liaise with Eurocontrol in attempt to acquire further information for the Assessment Methodology
3	Action: Colin to contact EST for the report and coordinates of micro wind turbines and send to Jason and Julian for their assessment
4	Action: Mark to release as much information as possible on the QinetiQ study to BWEA for Chris to send to Greater Wash developers
5	Action: Chris to invite Sensis over for presentation, provide date to RSG and ask for pre meet with aviation community
6	Action: Chris to circulate note to BWEA members, summarising developers concerns for their comments
7	Action: Jason to talk to Raytheon regarding coming to UK in May
8	Action: Duncan to request feedback on guidance document from PSG and circulate document in May
9	Action: Mark to organise next meeting