

**ELECTRICITY ACT 1989 (SECTION 36 AND SCHEDULE 8)
TOWN AND COUNTRY PLANNING ACT 1990 (SECTION 90)
THE ELECTRICITY GENERATING STATIONS AND OVERHEAD LINES
(INQUIRIES PROCEDURE) (ENGLAND AND WALES) RULES 2007**

**PUBLIC INQUIRY TO CONSIDER SECTION 36 ELECTRICITY ACT 1989
APPLICATIONS BY:**

- (1) STEADINGS WIND FARM LIMITED FOR CONSENT AND DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE A WIND FARM AT KIRKWHELPINGTON, NORTHUMBERLAND (KNOWN AS STEADINGS)**
- (2) AMEC PROJECT INVESTMENTS LIMITED FOR CONSENT AND DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE A WIND FARM AT RAY ESTATE, NORTHUMBERLAND (KNOWN AS RAY WIND FARM)**
- (3) WIND PROSPECT DEVELOPMENTS LIMITED FOR CONSENT AND DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE A WIND FARM AT GREEN RIGG FELL, BIRTLEY, NORTHUMBERLAND (KNOWN AS GREEN RIGG WIND FARM)**

OPENING STATEMENT

MINISTRY OF DEFENCE

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Introduction

1. The Ministry of Defence strongly objects to the development of any of these three wind farms.
2. Putting it in the simplest terms possible:
 - a 80-90m metal turbine in line of sight of an air traffic control radar is bad news for the operation of that radar;
 - a 80m-90m metal turbine in line of sight of an air traffic control radar at an air warfare range is very bad news for that radar; and
 - sixty 80-90m metal turbines in line of sight of an air traffic control radar at an air warfare range are extremely bad news for that radar.

I'll explain why shortly.

3. All of the turbines will be in line of sight to the two air traffic control radars servicing the RAF Spadeadam Electronic Warfare Tactics Range.
4. Such is their size, material composition, location and operating pattern, that each of the proposed wind farm developments will have a significant adverse impact on operations at RAF Spadeadam
5. As the proposals stand, they do not seek in any way to lessen this significant adverse impact. No doubt this is because there is no proven means, technical or otherwise, that can ameliorate these adverse effects. Further, there is no anticipated means, technical or otherwise, that offers any hope that within the next 5 years these adverse effects will be ameliorated.
6. The MoD nevertheless strives for and hopes to find remedial measures. It offers, and will continue to offer, such assistance as it can to those working to discover and develop such remedial measures. But its current assessment is that there is no realistic hope of discovering or developing any such remedial measure within the next five years. As such, the MoD is compelled to record its implacable opposition to each of these proposals.

The background

7. In 2002, the then Parliamentary Under Secretary of State for Defence and Minister for Veterans, stated in the Wind Energy and Aviation Interests Interim Guidelines ("**the Interim Guidelines**") that the MoD fully supports, and makes every effort to assist in achieving, the Government's renewable energy targets. However, he also stated that the MoD has concerns about the effects of wind

turbines on a number of MoD activities, including radar and low flying. He said that whilst efforts must continue to ensure flight safety and optimum radar coverage throughout the United Kingdom, the MoD awaited the results of a number of studies into these problems.

8. Before these studies were completed, the MoD used to assess wind energy proposals against its understanding at that time. Its understanding was more limited than it is today. A number of proposals during this period, including Green Rigg and Ray, were assessed as having marginal technical effect on radar. It was then believed that these proposed developments could be operationally accepted.
9. In May 2005 the report into a trial by the MoD to determine the effects of wind turbine farms on "Watchman" air traffic control primary surveillance radars was published. This proved that wherever there was radar "line-of-sight" between wind turbines and an air traffic control radar, the radar would be adversely affected – regardless of distance.
10. The trial's findings were alarming. They revealed a greater impact than that previously thought. This in turn required a more robust approach to wind turbine assessments. Previous research had predicted a "shadow region" behind the wind turbines within which primary radar responses would be masked. The trial confirmed this and gave a glimpse of the scale of the problem. It also proved that "clutter" was displayed to the radar operator as a result of the motion of the wind turbines. This clutter was assessed as highly detrimental to the provision of a safe air traffic service.
11. The report also showed that an air traffic control operator would not be able to distinguish between radar returns from turbine blades and those from real aircraft. Therefore, for the purposes of achieving separation, an air traffic control radar operator would be obliged to treat turbine-induced returns as though they were aircraft. Finally, the "probability of detection" of aircraft by the Watchman Radar was considerably reduced when aircraft were above or close to wind turbines.
12. The trial's conclusions stated that the presence of a wind turbine farm in line-of-sight of a Watchman radar has a significant impact on its ability to support air traffic control. This took two main forms, obscuration and displayed clutter. The former is largely, but not exclusively, the product of the shadow region. The latter is the result of strong radar reflections received from high "radar cross-

section" moving targets, like wind turbines. Due to the nature of the air traffic control task, it will always be necessary for controllers to honour the presence of a displayed radar return on their screen and treat it as though it were a real aircraft.

13. Based on the trial's findings, a new, more informed process of assessing the effects of proposed wind turbines against air traffic control radar supported operations at the MoD's establishments has been put into operation.
14. The Steadings proposal was subject to this process. It was assessed as having a detrimental impact which was unacceptable to the support of safe and expeditious operations as controlled by Spadeadam.
15. During consideration of the Steadings proposal, the MoD reconsidered the proposals for Green Rigg and Ray against its enhanced understanding. It was also concerned that it understood the likely cumulative impact of these three windfarms, as it is a relatively small area. When measured against the new assessment process, both these proposals were found to be unacceptable .

The basis of the MoD's objection

16. There are a number of inter-related grounds upon which the MoD's objection is founded.
17. First, it is now recognised that wind turbines in line-of-sight of a radar will cause responses on the radar display and that these can mask the presence of genuine aircraft returns – regardless of distance from the radar head. Military Air Traffic Service Regulations state that the provision of accurate traffic information to pilots is fundamental to an effective air traffic control service. Those Regulations go on to state that air traffic control services are to be provided to the maximum extent practicable, subject only to workload, communications or equipment capability, and that they are to be applied in accordance with the status of the airspace within which the participating aircraft are flying.
18. These wind turbines will impede that provision.
19. Secondly, there are different levels of radar service provided by controllers when providing air traffic services outside controlled airspace. These are the "radar information service" ("**RIS**") and "radar advisory service" ("**RAS**"). Effectively RIS requires the controller to provide information on conflicting traffic. It is then up to the pilot to decide what action he wishes to take, but it may include asking

the controller for a vector away from the conflicting track. However, RAS is a service provided to a pilot who is flying under “instrument flying rules” (“**IFR**”). As the title suggests, this means that the pilot is flying with reference to the instruments within the aircraft and is not looking outside (*e.g.* in bad weather). A pilot may still operate in accordance with RAS even if the weather is not bad when, for example, training/practising for bad weather or in a heavy cockpit workload flight.

20. Again, these wind turbines will impede the effective provision of these services.
21. Thirdly, during flights under instrument flying rules, the pilot relies on the air traffic control controller providing the advice necessary to avoid conflicting tracks. JSP552 (the Manual for Military Air Traffic Regulations) states that when operating under RAS:

“the controller will provide advice necessary to maintain prescribed separation between aircraft participating in the advisory service, and in which he will pass to the pilot the bearing, distance and if known, level of conflicting non-participating traffic, together with advice on action necessary to resolve the confliction.”

It further states:

“the avoiding action instructions which a controller may pass to resolve a confliction with non-participating traffic will, where possible, be aimed at achieving separation which is not less than 5 nautical miles (nm) or 3000ft, except when specified otherwise by the regulating authority.”

This standard separation criteria is also published within the civil Manual of Air Traffic Services Part 1 and is the UK National standard.
22. This therefore requires that a controller providing a RAS to an aircraft avoid the radar returns presented by the turbines by 5nm. This is because they will appear as moving solid returns with no height indication for the controller to assess. They will appear on the controllers’ display as intermittent returns which would present themselves in a manner similar to a slow moving or manoeuvring aircraft. As this site is adjacent to a heavily utilised area of general aviation operations, the controller would not be able to determine whether it is a turbine or flying craft. The result will be that, when providing a RAS, the controller will have no choice but to avoid the returns by 5nm.
23. Fourthly, aircrew may also elect to fly under “flight information service” (“**FIS**”). This is a non-radar ATS provided for the purpose of supplying information useful for the safe and efficient conduct of flight. Under this service, where a controller suspects that a flight is in dangerous proximity to another aircraft, a warning is to be issued to the pilot.

24. Again, these wind turbines will impede the effective provision of this service.

The importance of RAF Spadeadam

25. RAF Spadeadam is the only electronic warfare tactics range in the United Kingdom. It is one of only two in north-west Europe. It is principally used to train aircrew to evade radar-guided missiles. On any normal view it is both a very important military training facility and a national asset. It is, I should add, frequently used by our NATO colleagues.
26. The training undertaken at RAF Spadeadam involves aircraft completing high-energy manoeuvres, with the pilot concentrating on tactics and the various aircraft systems. This results in a high cockpit workload. This training can take place within 60nm of RAF Spadeadam, currently up to FL245 (24,500 feet). This is imminently to be increased to FL660 (66,000 feet). The role of air traffic control at RAF Spadeadam is to provide air traffic services to an aircraft whilst it is conducting its electronic warfare training. Effectively air traffic control provides the lookout for the pilot.
27. Due to airspace restrictions around RAF Spadeadam, the standard entry and exit routes are limited. One of the main routes into RAF Spadeadam from the east is North of Newcastle CTZ and in and around the Hexham gap, south of Otterburn Range. To complete the air traffic control task, RAF Spadeadam has two Watchman Radars, one at Berry Hill and one at Dead Water Fell. The radar head at Dead Water Fall is angled 10 degrees down to provide better low-level coverage, especially in the Hexham gap.
28. The windfarms at Ray, Steadings, and Green Rigg will place a significant limitation on operations at RAF Spadeadam. Obstructions in the entry bottleneck (*i.e.* in and around the Hexham gap) will have a significant adverse impact on low flying. As flying low and trying to use the terrain to evade a threat radar is one tactic the pilot will wish to use, pulling up to fly over the windfarms will expose him, which will place constraints on the aircrew and reduce the realism of the exercise. If the aircraft attempts to stay low and fly around the windfarms, then the low flying will be concentrated in an already restricted area and the pilot will be flying through areas of high traffic density which relies on pilot 'lookout' to identify a hazard and avoid whilst still responding to alarms and indications from instruments within the cockpit.

Conclusion

29. The turbines in the three proposed windfarms will be in line-of-sight with the air traffic control radars at RAF Spadeadam. These will produce radar returns, masking and shadow on the controller's radar display. These returns, masking and shadow will occur in an area identified as requiring high levels of air traffic control interaction/intervention with participating aircraft. Further, there is a strong probability that the effect of the proposed turbines will prevent the timely identification or maintenance of track identity of aircraft requiring an air traffic service from RAF Spadeadam.
30. Spadeadam is the only electronic warfare tactics range available to UK military aircraft. It is a national asset with which to conduct extremely important tactics for the survival of aircrew operating in a hostile environment.
31. The proposed turbines, individually and collectively, would have an unacceptable impact upon the operations controlled by air traffic control at RAF Spadeadam. Therefore, the MoD strongly objects to the proposed windfarms.
32. Complaint has been, and no doubt will continue to be, made that the MoD has modified its stance. So it has. The MoD's assessment has evolved as its understanding has increased. It has made mistakes; but it has corrected them. This is to be commended rather than condemned. It is to be expected that a maturing technology will see shifts in view. It is that very process that gives the glimmer of hope. That hope will not be fulfilled if the difficulties are not acknowledged. It is recognition of the difficulties that will drive the search for a solution. The MoD hopes that one day the difficulties that compel it to object at this Inquiry can be overcome. But that day is not today; and it is not any foreseeable day in the next five years.
33. There is nothing unavoidably unfair to AMEC, or to the other developers, in this Inquiry. If AMEC thinks that there is, it could and it should have made an application to the High Court, at the very latest immediately after 21 December last year. The High Court is the proper forum for Mr Norris's unfairness complaint. Mr Norris knows that. And yet, AMEC has not made any such application to the High Court. Instead, they continue to complain to you how unfair it all is. They complain that the MoD's objections are just theoretical. Then they tell us that they are not going to put any of this to any of the MoD's witnesses. Can I just underline that. Mr Norris describes (*Opening* §14) the MoD's objection as a "very important, arguably decisive, consideration." But he is not going to put a single question on this "very important, arguably decisive"

consideration to any of the MoD's witnesses. These are the very people who speak to it. That is fine if that is what AMEC want to do. However, as a matter of law, if a party does not put to a witness of another party the points of dispute with that witness' evidence or attack the witness' credit, it is not open to the first party to submit that that witness' evidence should be rejected. You cannot adopt a cross-examination that has not yet been heard or delivered. So I put a marker down. Either AMEC puts it case to the MoD witnesses or, as a matter of law, it will have forfeited its ability to submit that the MoD's evidence should be rejected.

34. These applications should be rejected.

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