

## Clash Gour windfarm ACP Stage 2 feedback

This response is submitted on behalf of the British Gliding Association. The British Gliding Association (BGA) is the governing body of sport gliding in the UK and represents the interests of some 6500 members of the UK's 78 gliding clubs including the operators of some 2200 sailplanes.

### General:

We note that the Design Options document proposes various solutions and then immediately dismisses them. So in reality, only one solution is proposed and that is for a TMZ, which of course has been the intended outcome right from the start of this process.

As we mentioned in the Design Principles feedback, safety is never absolute but should be ALARP. The ARP of course being "as reasonably practicable". This should take into account the relative gain in safety that a restriction might bring, vs the "pain" ie loss of freedoms and/or monetary cost. There is no point introducing a restrictive and costly solution if the increase in safety is insignificant. The stage 2 consultation document has not addressed this issue since there has been no attempt to evaluate the actual reduction in safety that "do nothing" would introduce. The area in question is quite small and in a fairly remote part of Scotland so has very little GA traffic, even less non-SSR GA traffic. GA traffic tends to be at a maximum at the weekends whereas activities at Inverness and Lossiemouth tend to be at a minimum. The ACP should review radar and other records to evaluate the actual reduction in safety that would occur with "do nothing", and/or consider whether the restricted airspace needs to be in place at the weekends. Perfection can never be achieved and so should not be sought.

We note that in the Design Principles Engagement Report, Appendix A list of stakeholders, the Highland Gliding Club at Easterton, situated about 8 miles ENE of the windfarm and visible on your maps, and who will suffer the most adversely if a TMZ is introduced, is not mentioned, despite the fact that their representative attended the focus group in Elgin.

The document contains a lot of opinion and anecdotal evidence from ATC providers, none of which is backed up by any data or hard evidence, despite the proliferation of other windfarms in the area which could provide data and example. Numerous windfarms already exist that do not seem to require a TMZ, including of course the Berry Burn farm which is very close to the new proposed windfarm. It is very difficult to understand why that windfarm has been operating with an adequate level of aviation safety since 2014, and yet expanding the overall windfarm area somewhat by the Clash Gour structures, suddenly requires an airspace restriction. It seems to the BGA that the existing windfarm has been a bit of a nuisance to ATC and they see an opportunity with this new addition, to make their lives easier at the expense of others and at no cost to themselves. The pain to members of the BGA and in particular the Highland Gliding Club, of course being the need either to pay around £2500 per aircraft for SSR equipment (when an entire glider can be purchased for not much more), or to consider the area very close to their airfield and in good soaring territory, as prohibited airspace.

This seems to be going for the softest target, "pain" directed not at the company seeking to profit from the windfarm, nor from the airport who profits from the services they provide, nor from the MoD who receives a massive budget from HM Government, but instead the pain is directed solely at the softest target, the leisure aviator who lacks any sort of external funding, does not operate at a profit and thus cannot afford professional representation.

## Technical:

Rotating wind turbine blades only trigger the Doppler threshold when the axis of rotation is close to 90 degrees to the radar head – ie the blades are moving towards or away from it. A wind turbine facing or with its back to the radar head does not create significant relative motion and thus the Doppler threshold will not be exceeded. Circumferential movement is not detected by Doppler but by comparing sequential pulses via a delay line (or equivalent more modern electronic techniques), however the target has to move a significant distance (azimuth angle) for this to be triggered and it seems highly unlikely that upper and lower blades swapping places (ie moving both ways over a very small azimuth angle as seen by the radar) would trigger this. Typically an airfield radar has a 4 second rotation and 250Hz PRF ie 1000 pulses per revolution, each pulse being 0.36 degrees apart. Lossiemouth is 20km away so 0.36 degrees equates to 125 metres which is more than the in-out movement of a 3 bladed turbine facing the radar (2 blades at 60 degrees and one at 90 degrees, reversing). Inverness is approximately twice the distance away.

So the problem, such as it is, is only likely to occur when the turbine is predominantly at 90 degrees to the radar heads.

The location of the windfarm is such that the bearings of Lossiemouth and Inverness' radar heads are at roughly 90 degrees to each other. In other words, when the relative turbine tip velocity is at a maximum for one of the radar heads, it will be near zero for the other one. When the wind is such that the turbines are midway between the two radar heads, the maximum relative velocity will be significantly reduced probably to below the Doppler threshold. However since no data is provided for the maximum turbine tip speed, the probability distribution of turbine tip speed (weather dependant) nor the radar Doppler threshold speeds, it is not possible from this consultation document to determine how often or if ever the Doppler thresholds for both radar systems will be simultaneously exceeded. In the likely event that it would be never or very rarely, the obvious solution which hasn't been considered is for Lossiemouth and Inverness to share each other's primary radar data, using the one that remains unaffected by the breach of Doppler velocity threshold and also providing "fill in" for any low level blanking effect behind the turbines. Of course historically, before Inverness had its own radar, it used a feed from Lossiemouth, so this concept is not new.

The adverse radar effects are described only in the most general terms. There is no actual data or evidence presented. The word "could" is used 7 times in the document, 5 times of which refer to possible adverse radar effects. Some of the adverse effects mentioned seem to fall into the "nuisance" category, rather than anything actually having a significant effect on flight safety.

It should also be borne in mind that in the context of a military aircraft and an airliner, the volume of airspace in question is extremely small especially if both primary radars are used by both ATC units (so that there is no blanking effect behind the turbines). An obvious solution for those aircraft unwilling to risk the extremely remote possibility of a MAC, is to avoid this small area. Of course for a glider, due to the much lower speeds and limited range between sources of lift, the area is large and located over prime soaring terrain.

It may also be possible to adjust the elevation of the radar heads or have low level physical blanking on the relevant azimuth, so that that, especially for Inverness who are not in the habit of providing a service to CAT below say 2000' the radar passes over the top of the windfarm and so none of the mentioned adverse effects that might otherwise happen, would be manifest.

It also needs to be borne in mind that an aircraft will not take off or land within the proposed TMZ area (it is unlandable even for a glider), so any aircraft entering the area of possible clutter will either be seen leaving it again, or will still be within that area. If an aircraft remains within the

area (eg a glider thermalling), an aircraft receiving an ATC service would have to be vectored around the area, but bearing in mind the size of the area, this doesn't seem onerous.

Finally, regarding Option 7 sub-categories, it needs to be remembered that ATC would be delighted if the entire country was a TMZ, because it would make their life much easier. However if a TMZ is actually required (which seems unlikely) then any buffer should be a minimum. The statement "best practice" to justify a 2nm buffer is meaningless, or rather whilst it might be "best practice" for ATC, it certainly isn't "best practice" for non-compliant GA aircraft. A lot of text is provided around what might happen if a non-compliant aircraft was seen entering the TMZ, but the reality is that for a military or CAT aircraft within the TMZ, their speed would mean that they would be out of the TMZ before much could be said. In fact a buffer just expands the area of concern, taking longer to transit and pointlessly increasing controller workload. In other words, the justification for a buffer seems extremely weak.

### **ACP Process:**

To summarise what is happening here, a commercial organisation (CGH) wishes to build a new wind farm for profit. Third party organisations (Inverness and Lossiemouth) have said that to achieve its profitable goals without binding objection, a TMZ must be created regardless of actual need. The sponsor thus seeks this TMZ only to satisfy its objectors. The sponsor has no interests in aviation except for removing the planning obstacle placed in its way by third parties. So this ACP is just a vehicle to meet the demands of the third parties, with the outcome being predetermined and not based on any aviation safety issues. As such it seems an abuse of at least the spirit of the ACP process.


### **Summary:**

In summary, the BGA objects to the proposed TMZ because no real attempt has been made to justify it on safety grounds, and at first glance the safety implications seem minimal due to the density of traffic in the area. It would have a major detrimental effect on gliding and especially on the Highland Gliding Club at Easterton. No actual evidence has been presented which explains why the current onshore windfarms are acceptable and the new one would not be. Any safety case should be split between weekdays and weekends, because weekend operations at Inverness and Lossiemouth are generally minimal, whilst operations at Highland Gliding Club are at a maximum.

The BGA endorses the "do nothing" solution as is the case with so many other onshore windfarms.

A number of possible easy technical solutions including sharing of primary radar data between Lossiemouth and Inverness, have not been considered.

The motivation behind and nature of this ACP seems to the BGA to be an abuse of the ACP process.

  
British Gliding Association  
25/4/2022