Technical Appendix 1.6: Turbine Lighting

Introduction

- 1.1. To meet net zero targets, wind turbines need to increase their energy capacity and one way to achieve this is to increase the size of the rotor blades, which in turn necessitates an increased tip height. However, it is legislated in the UK that obstacles above 150 metres are required to have aviation lighting fitted so due consideration has been given to Mullaghclogher Wind Farm in this respect.
- 1.2. Article 222 of the Air Navigation Order (ANO) 2016 (amended 2021) states that an en-route obstacle must be fitted with medium intensity (2000 candela) steady red aviation lights as close as possible to the top of the obstacle and at intermediate levels between the top lights and ground level unless the aviation authority has granted permission not to fit lights.
- 1.3. A wind turbine with tip height of 150 metres or more, not located in the vicinity of a licensed aerodrome, is defined as an 'en-route obstacle' for the purposes of aviation.
- 1.4. In June 2017, the Civil Aviation Authority (CAA) issued a policy statement related to lighting of onshore wind turbines for tip heights in excess of 150 metres above ground level (AGL) to clarify the UK application of ANO Article 222.
- 1.5. The CAA considers the top of a wind turbine generator to be the maximum blade tip height, however, in terms of locating the aviation lighting on a wind turbine, the ANO term, "as close as possible to the top of the obstacle", is deemed to be on the nacelle
- 1.6. The CAA requires that a wind turbine is:
 - Fitted with a medium intensity (2000 candela) red light on the nacelle that displays in all directions, along with a second back up light in case of failure
 - Fitted with at least three (to provide 360 degree coverage) low-intensity (32 candela) lights at an intermediate level of half the nacelle height
 - Operated by an acceptable control device to ensure the lights will be turned on when illuminance falls below 500 LUX and turns the lights off when the illuminance rises to a level of 500 LUX or more

Proposal

1.7. The CAA has been consulted about the lighting requirement for Mullaghclogher. Given that the site is in a relatively low area of activity from an aviation perspective, an 'in principle' night time aviation lighting scheme has been agreed with the CAA as a variation to the lighting requirements specified in ANO Article 222, as follows:

- medium intensity steady red (2000 candela) lights on the nacelles of turbines T01, T02, T05, T06, T08, T10 and T11;
- a second 2000 candela light on the nacelles of the above turbines to act as alternate in the event of a failure of the main light (note that both lights should not be lit at the same time);
- lights capable of being dimmed to 10% of peak intensity when the lowest visibility (as measured at suitable points around the wind farm by visibility measuring devices) exceeds 5 km;
- a scheme of infrared lighting to be agreed with the Ministry of Defence (MOD) to account for operators who carry night vision device capability (note that dimming permission is applicable only to visible lights, not infra-red lighting).

A final scheme for aviation lighting will be agreed with the CAA and MOD post planning consent.