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USE OF AIRCRAFT DETECTION LIGHTING SYSTEMS IN THE NETHERLANDS

1 INTRODUCTION

Obstacles of 150 meters or higher shall be lighted according to the international ICAO safety requirements. This is essential to make these obstacles visible for aviation. The focus on climate change and developments in wind energy production have resulted in an increase in the number of wind farms and the height of these wind turbines. The modern generation of wind turbines have a tip height of 250 meters or more. Consequence of the increase in the tip height of wind turbines is that most of them need to be equipped with obstacle lights for aviation purposes.

The presence of obstacle lights on wind farms can be a nuisance for residents living in the vicinity, especially during darkness. Studies have been undertaken how the nuisance from obstacle lights can be reduced for people in the surrounding without compromising aviation safety. Several measures have been discussed in the Dutch national project group on obstacle lighting. A promising solution is the use of Aircraft Detection Lighting Systems (ADLS).

With the technology for aircraft detection, it is possible to switch the obstacle lights on and off according to the need of visibility for air traffic. In practise this means that the obstacle lights are only switched on if there is an aircraft in the vicinity of the wind farm. The obstacle lights are important for pilots in visual flight conditions at an altitude below 2000 FT GND. The available technology comprises aircraft detection systems based on signals from a designated radar or on signals from the transponder of the aircraft. For this reason, it is mandatory as of 01 October 2021 to use at least a Mode S/ELS transponder when flying outside UDP.

2 RADAR-BASED AIRCRAFT DETECTION

In 2018 a test was conducted with a small mobile radar near a wind farm to assess whether the radar is able to detect an aircraft in all circumstances during several flight patterns around a wind farm. Conclusion of this test was that the ADLS proved to be able to detect the aircraft properly and to switch the lights on when the aircraft entered the defined warning zone around the wind farm. As a result of this test requirements for the use of a radar-based ADLS have been developed.

3 TRANSPONDER-BASED AIRCRAFT DETECTION

In Germany the new technology of an aircraft detection system based on transponder signals from aircraft is being used. The Dutch wind energy industry requested to make the use of this method also possible in the Netherlands. Therefore, a comprehensive set of requirements has been developed by the project group on obstacle lights based on the German legislation for the use of ADLS.

4 REQUIREMENTS FOR THE USE OF ADLS

Although requirements for the use of ADLS have been developed and approved by the national project group on obstacle lighting, they are not formal law yet. The prescriptions on obstacle lights and the use of ADLS are contained in an information circular as guidance document. For reasons of oversight and enforcement it is necessary to implement these requirements in the new spatial planning legislation which will become applicable next year. Until the legal implementation of the requirements is finalised the CAA can grant permissions for the use of an ADLS at wind farms on an individual basis in the form of pilot projects.

5 WIND FARMS EQUIPPED WITH ADLS IN THE NETHERLANDS

Currently, there are two wind farms where an ADLS is installed and tested, wind farms Fryslân and Krammer. The ADLS at both wind farms will use a warning zone for pilots of at least 5.5 KM. In due time other wind farms in the Netherlands may also be equipped with ADLS.

5.1 Wind farm Fryslân

At wind farm Fryslân, which is located in the north part of the IJsselmeer, a pilot project for a radar based ADLS is in progress. The radar installation is installed in October 2021 and a flight test is planned for November 2021. After a successful flight test the ADLS will be operated on a permanent basis.

5.2 Wind farm Krammer

At wind farm Krammer, which is located in Zeeland on the Philipsdam, a test for the proof-of-concept of a transponder-based ADLS is in progress. The documentation of the system is approved, and the installation of the equipment is done in October 2021. The flight test is planned for the end of October 2021 and after a successful flight test the ADLS will be operational in November 2021 permanently.

6 VFR FLIGHTS OUTSIDE UDP

As of 01 October 2021, VFR flights outside UDP shall activate the mode S transponder.

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