DTBird® versus Radar Technology in operating Wind Farms

FEATURE		DTBird®	Radar Technology	DTBird® versus Radar
Bird Detection	0 - 150 m to Wind Turbine [1,2]	**>85 %**	**<15%**	**>5 times better**
	0 - 300 m to Wind Turbine [1,2]	**>75 %**	**<30%**	**>2.5 times better**
	Detections per second (s) [2,3]	**5 per s**	**1 every 2 s**	**10 times faster**
	Track required to discriminate birds[2,3]	**<2 s**	**12 s**	**6 times faster**
	Confidence in Bird discrimination[2,3]	**100%**	**Requires Visual verification with systems as DTBird®**	**Radar needs DTBird® system**
	Bird identification to Species/Group level [2,3]	**Yes**	**No**	**DTBird® unique feature**
	False Positives [2,3]	**<1/day**	**100s**	**>100 times better**
Bird Dissuasion [4]		**Yes**	**No**	**DTBird® unique feature**
Bird Collision Control		**Yes (detectability >95%)**	**No**	**DTBird® unique feature**
Wind Turbine Stop Control	Frequency	**Infrequent Stops: Actual Flights with Collision Risk**	**Frequent Stops: Modelized Flight in Collision Risk areas[5]**	**DTBird® Stops shortly the Wind turbine with actual Bird Collision Risk**
	Stop Duration	**Short Stop (1.5 - 3 minutes)**	**Long Stops: Modelized Flight in Collision Risk areas[5]**	
	Nº Wind turbines	**Stop only Wind turbine with the actual Flights with Collision Risk**	**Stop Several Wind turbines: Modelized Flight in Collision Risk areas[5]**	
Data Analysis		**Visible Videos and Data easy to interpret and understand.**	**Complex Data, difficult to interpret and understand.**	**DTBird® Bird-Smart and transparent System for Wind power Management**
Dedicated personal for System Management in the Wind farm		**No**	**Yes**	

[1] Values for Daylight period (>200 lux), according to reference 2.
Daylight + Night at 0-300 m: mean detectability DTBird®: 70%, Radar: 50%;
Daylight + Night at 0-150 m: not calculated, because Radar does not contribute with a significant number of flights at 0-150 m, where it is nearly blind, independently of light levels.

[2] May, R., Hamre, Ø., Vang, R. & Nygård, T. 2012. Evaluation of the DTBird® video-system at the Smøla wind-power plant. Detection capabilities for capturing near-turbine avian behaviour. NINA Report 910. 25 pp.

[3] Kelly, T.A., West, T.E., Davenport, J.K (DETECT, Incorporate authors). 2009. Challenges and solutions of remote sensing at offshore wind energy developments. Marine Pollution Bulletin, Volume 58, Issue 11, November 2009. Pages 1599-1604.

[4] Bird Dissuasion definition: automatically emission of Warning/Dissuasion signals linked to real-time bird detection in Moderate/High collision risk areas (<150 m to the Wind turbine). At <150 m to the Wind turbine, Radar is nearly blind (see references 2 and 3).

[5] According to references 2 and 3, Radar is nearly Blind close to the Wind turbine, and according to reference 3, Radar systems have to modelize bird flights through algorithms, producing Stops for potential Bird Flights (no actual flights) in the Collision Risk area.