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Quantifying the impact of the wind climate for Amsterdam International Airport

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The Climate Services department of KNMI, with funding from Amsterdam International Airport (Schiphol) and the research program Knowledge for Climate, has conducted research into the impact climate (change) has on the operation of the airport. Information about the future climate will help Schiphol make choices concerning the growth of the airport. The two year long project is now finished and during its course meetings were arranged between the research team and representatives of the airport to keep them up to date with how the research was developing and to give them the opportunity to participate in determining the course of the research.

The capacity of an airport is not only limited by safety regulations but also by legislation on noise pollution. At Schiphol the runway combination that disturbs the least amount of people will therefore be used to its full capacity before flights are scheduled on the second best runway combination. Weather conditions may however force Schiphol to choose runway combinations lower on the "noise pollution priority list" making it harder for the airport to meet noise pollution legislation without reducing the number of flights.

Of all the weather elements, wind is the most important limiting factor for the choice of runway combinations. When the component of the wind speed or gust in relation to the orientation of the runway exceeds a certain (tail wind or cross wind) limit, safety considerations require that the runway should be closed.

The aim of this study is to describe the present wind climatology of Schiphol Airport and the frequency of occurrence of runway closures due to tail and cross wind. Also three wind climate scenarios are presented for the next 10 years: one assuming a continuation of the 0.9% per decade decreasing trend in wind speed based on nearly 40 years of Schiphol measurements, one assuming an increasing trend of 0.1% per decade conform the most extreme climate model based KNMI scenario and the last one assuming no significant change in wind climate which is what most climate models and some measurements suggest. For each of these future climates the effect of the large year to year variability of the wind speed on the operation of the airport will be demonstrated.