1 Introduction

This Request for Information (RFI) describes the requirements and preferences for bird radars installed on six military airbases of the Royal Netherlands Air Force (RNLAF) in the Netherlands.

1.1 General introduction

For several decades bird strike prevention is an important issue in the RNLAF, as well as en-route as on the airbase. In the RNLAF airbases both habitat management and active bird control are used to control bird hazard management, with innovation of new technics and methods as a third pillar. Like in the en-route bird strike prevention, an accurate detection of birds in the air on and around airports is crucial to reduce the number of bird strikes. The latest developments in this fields are dedicated bird radars.

Bird radars are capable of distinguishing between birds, aircraft and cars and therefore provide ATC users with important information not available for them at the moment. Bird radars equipped with their own ADS-B receivers will be used as ground radar to support ATC with traffic information in the landing area to raise situational awareness, especially during bad weather situations. Furthermore the system will support ATC with the detection of runway incursions and applications in detecting air space infringements.

The bird radar will be used for three different purposes:

- to prevent bird strikes;
- to judge risk assessments for new spatial planning activities;
- to prevent runway incursions and airspace infringements.

1.2.1 Bird strike prevention

The objective of the bird radar is twofold and both support the improvement of flight safety. On one hand measure the effectiveness of our habitat management and active bird control, on the other hand supporting the operational process by informing the bird control unit with relevant information on bird activity. The information should consist on numbers of birds in the runway environment as well as alarming bird control to flocks with a significant change on a bird strike, so called near-miss events.

1.2.2 Risk assessments in airport vicinity

New spatial planning activities in the airport vicinity (6 km range) are checked for bird attractants (as laid down in Dutch Aviation Policy Memorandum). Archived bird radar measurements will identify all bird movements in the airport vicinity, identifies so called bird hotspots (e.g. roosting birds), which underpin risk assessments. Future radar measurements will be used for monitoring and eventually adjust the activities.

1.2.3 Runway incursions and airspace infringements

The use of bird radar as ground radar with ADS-B capacity and identification by transponder of vehicles and aircraft will give ATC not only awareness improvement operating under all weather conditions, but also a system which alerts ATC in case of a runway incursion or airspace infringement. Alerting ATC immediately offers them to react accordingly and correct the resulting situation. The software of this system will be programmable to the specific situation on each aerodrome to help reduce the risk of those incidents with tailor made solutions. Furthermore, the possibilities to identify traffic in the runway environment, offers being pro-active and thus significantly improve flight safety.

2 System requirements

This chapter describes the requirements related to the operational use of the system. Is your bird radar system compliant with the following **requirements (R)** and **preferences (P)** and also describe how this is implemented or needs customization of your bird radar system.

2.2 General functionality

(R) How is your bird radar setup (shelter, existing buildings, weather)?

(R) Is your system resistant to salt conditions?

(R) How is your system able to provide an almost 3D picture of flying birds in the runway environment up to a 6 km range according to the airport vicinity bird boundary area?

(R) How does your system use ADS-B information for high quality aircraft/vehicle recognition ground clutter and weather clutter filtering?

(R) How does your system provide altitude information above at least the runway?

(R) Is your radar systems update- and processing frequency fast enough to provide real-time control actions?

(R) How does your system handle complex clutter rich environments?

(R) Is data stored in a (geo-spatial) database? Please describe what tools you provide to quickly analyse spatial and temporal patterns.

(R) How is your database management system set-up and does it allow users with at least one month of data available on the live system for quick access and playback functionality?

(R) Does your database system allow users with up to one year data, which is accessible for bird control staff or ATC staff in case of ADS-B functionality?

(R) How does your system archive historic data and will this be assessable for playback functionality or data analysis?

(R) How does your system distinguish between birds, vehicles and aircraft?

(R) How does your system discriminate between birds and insects?

2.3 Requirements related to operational bird control

(R) How do you provide the bird control user in his car with real-time information?

(R) Does your real-time system provide information of life-birds and aircraft as well as a short history of the latest activities in the field?

(R) What distinctive bird classes does your system divide?

(P) Have you done field tests to validate your distinctive bird classes?

2.4 Requirements related to bird control staff

(R) Does your system has a functionality for playback archived up to real-time bird movements on a map?

(R) What tools does your system use to analyse spatial and temporal patterns?

(R) Do these tools contain functions like bird densities, bird fluxes, runway crossings, near-miss calculations with aircraft and/or hotspot identification (i.e. high bird concentrations) per distinctive class? Describe them briefly.

(P) Do these tools project spatial visualisations on a map?

2.5 Requirements related to ATC

(R) Is your system able to detect transponder data (aircraft, cars) and present these to ATC? If so, please describe them briefly.

(R) Is your system able to detect runway incursions and make a distinction based on a risk qualification? If so, please describe them briefly.

(R) Is your system able to detect *airspace infringements* (at least transponder code 7000 detection within a user defined area like the CTR area)? If so, please describe them briefly.

(R) Is your system software programmable so it can be tailor-made for each specific aerodrome in relation to the airspace and Runway traffic specifications?

(R) Is your system able to alert ATC by displaying and supplying acoustic signals? If so, please describe them briefly.

(R) Is the ATC radar display, able to adjust alerting and acoustic signal properties by the user?

2.6 Quality performance

(R) How do you guarantee an overall uptime of your system of at least 95% of the time?

(R) How can you control your system performance on at least main- and sub-components to diagnose the system?

(R) What end of life time of the system do you guarantee?

2.7 Safety requirements

Are the following safety requirements met in your system?

- (R) The European R&TTE guidelines (1999/5/EC en changes) regarding emission.
- (R) Electrical safety is compliant with European standards, such as IEC 50110.
- (R) Lighting protection and safety is compliant with European standard (IEC 62305).
- (R) Radar sensors are checked against international standards (IEC 62388, 60945, 61993, 61162).