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IMPROVING THE BIRDSTRIKE WARNING SYSTEM IN CENTRAL EUROPE

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SUMMARY

The Bird Movements and Low-Level Working Group shall develop preventive measures to minimize the bird hazard to low flying aircraft. Whereas civil aviation is focussed to the birdstrike problem at, or in the vicinity of aerodromes, military aviation needs birdstrike warnings covering larger areas. The Belgian, Danish, Dutch and German observation and warning procedures have shown that an improvement of the system is only possible if calibrated radar observations of bird movements are performed continuously, and birdstrike warnings are transmitted without delay and loss of information.

1. Introduction

According to the recommendations of BSCE 18, Copenhagen, the Bird Movement Working Group shall develop preventive measures to minimize the bird hazard to low flying aircraft. The progress report of the first two meetings "Bird Hazard at Low Level" was presented at BSCE 19, Madrid, and BSCE agreed on the new title "Bird Movement Low Level Working Group" considering the importance of the additional purpose. The participants emphasized that the procedures of birdstrike warnings/BIRDTAM are mainly significant for military aircraft flying at low level. Therefore the military participants of BSCE 19 agreed to further contact on this subject beside the regular meetings of BSCE. In the meantime 2 meetings were held at the German Military Geophysical Office, Traben-Trarbach/FRG and one meeting at HQ RAF Germany, Mönchengladbach/FRG with the purpose of improving the birdstrike warning system in Central Europe.

2. International regulations for birdstrike warnings

The Air Navigation Commission of ICAO, at the 20th meeting of its 111th Session held on 25 March 1986, considered a proposal for amendments to Annexes 14 and 15 concerning bird hazard reduction. The proposed amendments should introduce new procedures for the assessment and reduction of bird hazards at, or in the vicinity of an aerodrome. The Air Navigation Commission considered a requirement for the introduction of a specific message relating to bird concentrations, possibly a form of NOTAM or "BIRDTAM". 53 States did not indicate position on this term. 7 states registered disagreement, 2 states indicated qualified agreement, and another state foresaw no difficulty in the introduction of such a message. The result reflects the specific position of Civil Aviation focussed to the birdstrike problem at, or in the vicinity of aerodromes. In these small areas the temporary birdstrike risk can be better indicated by local ATC-procedures than by NOTAM/BIRDTAM. The specific problems of Military Aviation are not considered by ICAO.

The NATO countries agreed on the usefulness and importance of birdstrike warnings covering larger areas outside the aerodromes/airfields. The format is laid down within the NATO by the standardization agreement STANAG 3879 FS-Birdstrike Risk/Warning Procedures (Europe). Until 1988 the STANAG had been ratified by 10 countries. During the Flight Safety Working Party (July 1989) France and Spain promised the ratification, whereas UK will only agree to

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the STANAG for the area of continental Europe. USAFE and CFE do not have the capability to generate birdstrike warnings and are reliant upon host nations for such services. Portugal did not ratify the STANAG, but has notified a national agency for the communication of bird intensity data. Countries having ratified the STANAG are not obliged to implement bird observations and to issue warnings. Birdstrike warnings are no forecasts but based on real oberservations of bird migration mostly by radar, but also visually by pilots or ground staff. Visual detection as well as the identification of bird echoes on the radar screen, and the determination of the bird intensity are difficult if standardized procedures and calibrated data are missing.

3. Effectiveness of the Bird Observation System

The existing observation system of bird movements is insufficient. Only 4 countries (Belgium, Denmark, Netherlands, and West Germany) observe regularly migratory movements of birds by radar, and these observations are not calibrated due to different equipments and techniques of identification. The general situation was explained in BSCE 19/WP6. In the meantime the following results must be emphasized:

In the Netherlands the electronic counting system ROBIN (see BSCE 19/WP40) is taken into operational use. This system extracts bird echoes at highest possible resolution from the raw radar video. Using the latest computer technology, specially developed filter algorithms and pattern analysis a synthetic bird migration image is produced and transmitted by telephone to a high resolution computer screen at the user's desk. Digitized raw data, statistical data on individual echoes and accumulations of more than one antenna resolution can be requested as well. After evalution by an expert of the Air Staff bird warning messages are issued. Due to the positive experience with the system RNAF has spent money for a second equipment.

In Belgium the electronic counting system BOSS (see BSCE'8,WP'6) is implemented at Belga Radar. The registration of bird intensities is independent of air traffic control purposes. In spring 1989 birdstrike warnings could be issued only till 15 march due to operational reasons. The intensities reported were often higher than the dutch ones, but on very busy migration days the results of both systems were similar. Belgium intends to establish a observation network based on military and civil radar stations covering the whole country with respect to bird movements, but the calibration of the different radar data seems to be a hard work.

In Denmark the electronic counting system FAUST (see BSCE8/WP8-2) is still in use. In spring 1989 bird intensities were missing for many weeks due to technical reasons. The intensities reported did not always correspond to the Belgian and Dutch messages due to technical and ornithological reasons, for in Denmark not only long term migratory movements but also local migratory patterns are recorded by radar.

In the Federal Republic of Germany all attempts to establish electronic counting procedures at the air defense stations have been without success. The photographic registration system is still in use (see BSCE18/WP5). In spring 1989 the bird intensities reported were generally lower than the intensities determined by electronic counting in the neighbouring countries. On main migration days in fall 1989, the bird intensities reported by a radar station in Schleswig-Holstein corresponded very well to the Danish and Dutch intensities; but differences of one step of the intensity scale between neighbouring radar stations are frequent. Radar stations in central and southern Germany mostly reported bird intensities below 5. The reason may be that in hilly areas bird migration runs partly below the lowest radar beam.

Further attempts were made to include several ATC-airfield radars in the German observation network. Though concrete instructions are still missing many bird observation messages were sent to GMGO from GAF- and RAFG- airfields in 1989. The main problem of these observations is the fact that ATC-radars operate within a smaller range than air defense radar stations, and record mostly bird movements at lower altitude. Therefore the bird intensities reported do not correspond to each other. The shortage of radar equipment and personnel makes thorough investigations with respect to bird intensities impossible, and to make matters worse, most ATC Radars have only synthetic videos, and a large amount of bird echoes gets lost during video processing.

4. Effectiveness of the Birdtam-System

Birdtam/Birdstrike Warnings are regularly distributed by Belgium, Denmark, The Netherlands, and West Germany. Except Germany all warnings are based directly on radar observations. In Germany the GMGO Forecast Center changes the observation message (by radar or visual) into warnings considering different keys in relation to type of observation, bird intensity and season. Therefore the number and the content of observation messages do not correspont exactly to the BIRDTAM. Nevertheless gaps between different

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BIRDTAM-areas are frequently existing due to an insufficient detection of migratory movements. During heavy bird migration in these gaps the bird-strike risk is similar to the risk indicated in BIRDIAM-areas. Improvements of the Birdtam-system are therefore depending on the quality of the observation network. All German BIRDIAM are distributed to foreign countries by telex (BFSTA/AFTN), and directly to CFE, RAFG and USAFE-bases in Germany. In these airforces standing procedures must provide that further distribution to the Flying Units is possible without any delay. The birdstrike hazard caused by large-scale bird movements can only be avoided respectively reduced if radar observations are carried out regularly, and the delay between the time of observation an the receipt of the warning by the pilots will be shortened.

5. Improvements recommended by the subgroup "Bird Hazard at Low Level"

A significant improvement of the warning procedures is only possible if calibrated radar observations of bird movements are performed continuously. Money spent for this task would improve considerably the flight safety without extending the present restrictions.

The appropriate authorities should pursue the aim of calibrated electronic assessment of radar data concerning the low level bird hazard and should evaluate the capability of currently deployed radar systems as well as the future or projected radar systems to fulfil the aim of electronic assessment of such radar data.

Neighbouring radar stations should compare the data of strong bird migration counted electronically or determined by photographic pictures for calibration and standardisation of bird intensities.

The ATC personnel of military airfields should be encouraged to test the feasibility of their radar for the observation of bird movements even though a general guidance is still missing.

The appropriate authorities should investigate the possibility of contributing to a dedicated multi-national system for the detection, reporting and dissemination of birdstrike hazard warnings.

BIRDTAM/Birdstrike Warnings are transmitted via ATC and Wx-networks. National air staffs should consider/reconsider, how the warnings can be obtained without delay and loss of information.