



Safety recommendation no. 490

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Safety deficit	<p>On 24 May 2012 a commercial aircraft operating under instrument flight rules was on a visual approach on runway 32 at Bern-Belp. At the same time, a helicopter operating under visual flight rules was crossing the airport's control zone. Traffic information was given to both aircraft and the crews confirmed that they had visual contact. A little later, in the Fokker 100 a resolution advisory (RA) was generated by the TCAS. The two aircraft finally crossed with a lateral separation of 0.7 NM and an altitude difference of 75 ft.</p> <p>Since 2006 several similar serious incidents occurred at different Swiss airports with class D airspace, all in connection with dangerous convergences of two aircraft. In each case at least one of the two aircraft was equipped with a traffic alert and collision avoidance system (TCAS).</p> <p>Analysis of these serious incidents indicates that information deficits exist, in particular concerning the possibilities and duties of air traffic control in Class D airspace and in relation to the consequences of the traffic alert and collision avoidance system (TCAS).</p> <p>Furthermore, these investigations indicate that visual estimates of distances in three-dimensional space and their evolution over time are difficult and therefore error-prone. Compared to subjective human estimation, TCAS constitutes a technically objective warning system. The warnings generated by TCAS, in particular resolution advisories (RA), therefore indicate at least a substantial risk of collision. The triggering of a resolution advisory also proves that the subjective estimates of the persons involved did not register the actual situation correctly, and this also is an indication that the "see and avoid" principle is subject to certain limitations.</p>
Safety recommendation	<p>The Federal Office of Civil Aviation, in co-operation with skyguide, should take effective and simple measures which ensure that especially in class D airspace or other airspace used by commercial aircraft without separation criteria at least the protection area of commercial aircraft in which a TCAS resolution advisory is triggered is not violated.</p>
Addressees	BAZL Bundesamt für Zivilluftfahrt
Investigation report concerning the safety recommendation	<u>Final report</u> <u>Schlussbericht</u>